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Mueller et al.

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(54) **IDENTIFYING DUPLICATE PRINTED PAPER CASH LETTERS**

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(73) Assignees: **Federal Reserve Bank of Kansas City**, Kansas City, MO (US); **Federal Reserve Bank of Chicago**, Chicago, IL (US)

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G06K 19/00 (2006.01)

(52) **U.S. Cl.**
USPC **235/462.01**; 235/435; 235/439; 235/454

(58) **Field of Classification Search**
USPC 235/462.01, 379
See application file for complete search history.

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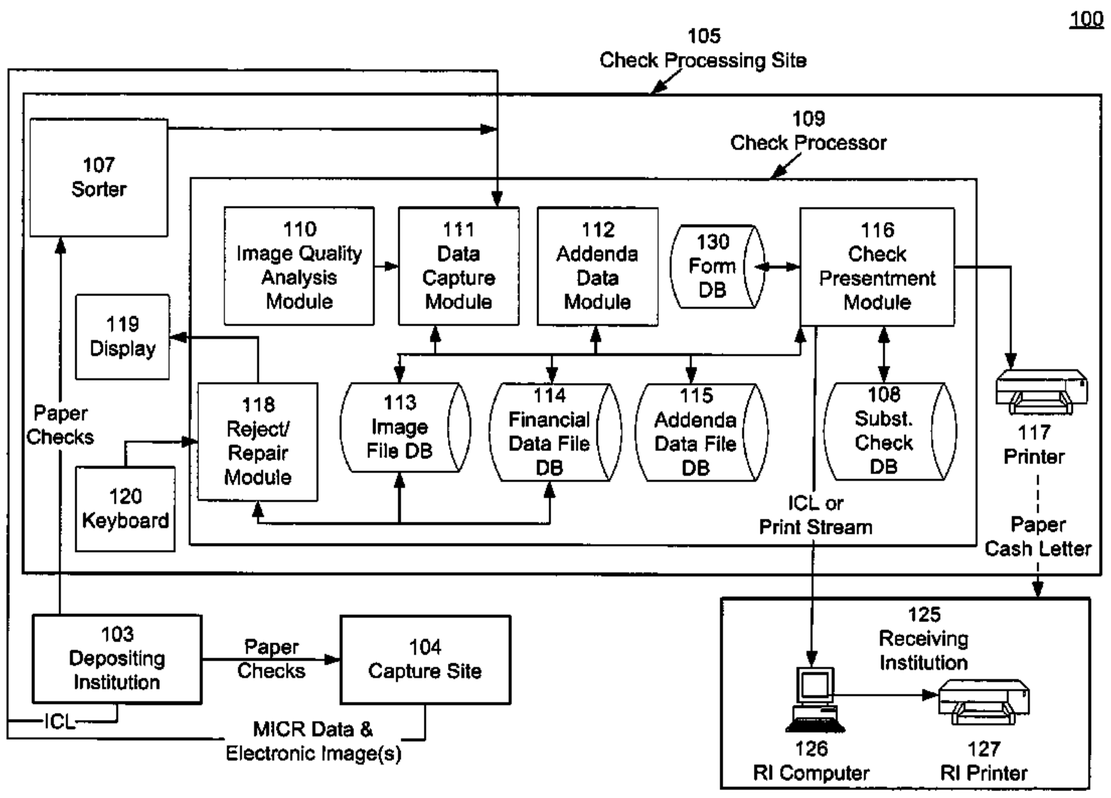
Assistant Examiner — Matthew Mikels
(74) *Attorney, Agent, or Firm* — King & Spalding

(57) **ABSTRACT**

A printed cash letter includes a machine-readable identifier, such as a barcode, identifying the cash letter. Upon printing, information from the identifier is read and stored in a first record. To determine whether the cash letter is a duplicate, a check presentment module compares information from the identifier with information in the first record. If information identifying the cash letter already exists in the first record, the cash letter is a duplicate. To verify cash letter printing, information identifying multiple cash letters to be printed is stored in a second record. Upon printing a portion of the cash letters, information read from identifiers on the printed cash letters is compared with information in the second record. If the second record includes information regarding a cash letter not identified in the information scanned from the barcodes, then the check presentment module identifies the cash letter as having not been printed.

37 Claims, 18 Drawing Sheets



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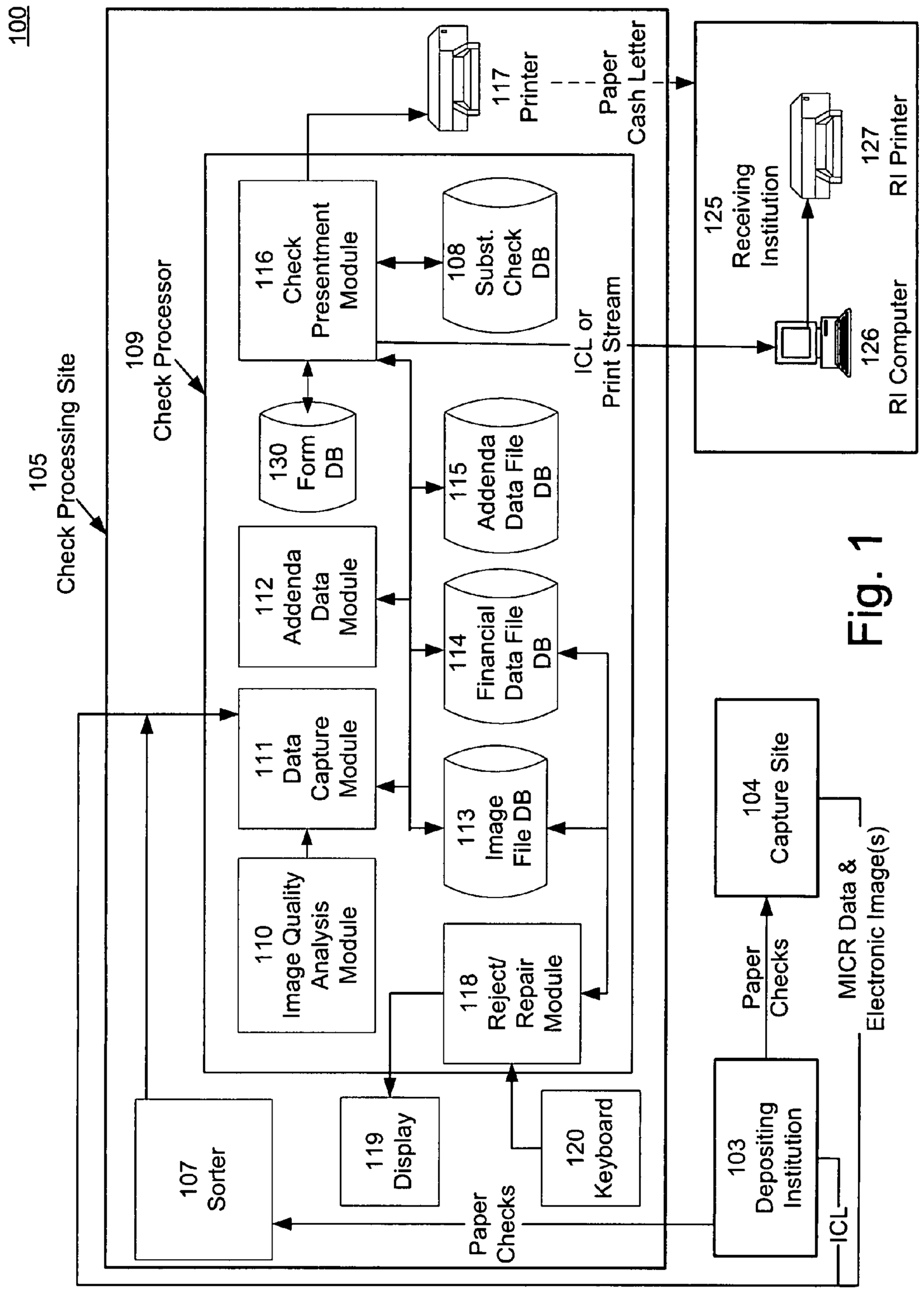
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105
Check Processing Site
109
Check Processor
116
Check
Presentment
Module
108
Subst.
Check
DB
117
Printer
Paper
Cash Letter
130
Form
DB
115
Addenda
Data File
DB
112
Addenda
Data
Module
114
Financial
Data File
DB
111
Data
Capture
Module
113
Image
File DB
110
Image Quality
Analysis
Module
118
Reject/
Repair
Module
107
Sorter
119
Display
120
Keyboard
Paper
Checks
ICL or
Print Stream
125
Receiving
Institution
127
RI Printer
126
Computer
104
Capture Site
MICR Data &
Electronic Image(s)
Paper
Checks
103
Depositing
Institution
ICL

Fig. 1

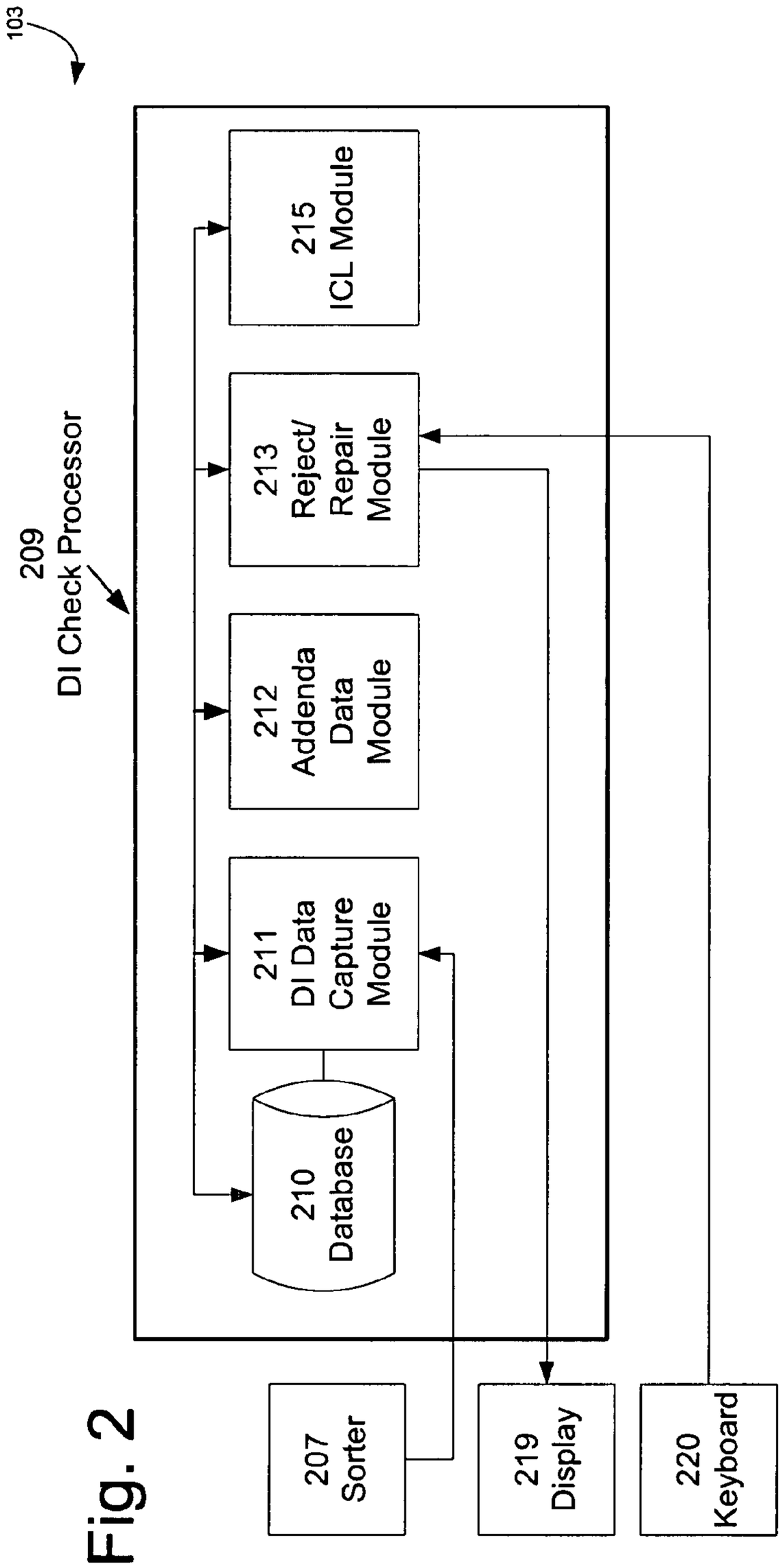

103
209
DI Check Processor
215
ICL Module
213
Reject/
Repair
Module
212
Addenda
Data
Module
211
DI Data
Capture
Module
210
Database
207
Sorter
219
Display
220
Keyboard

Fig. 2

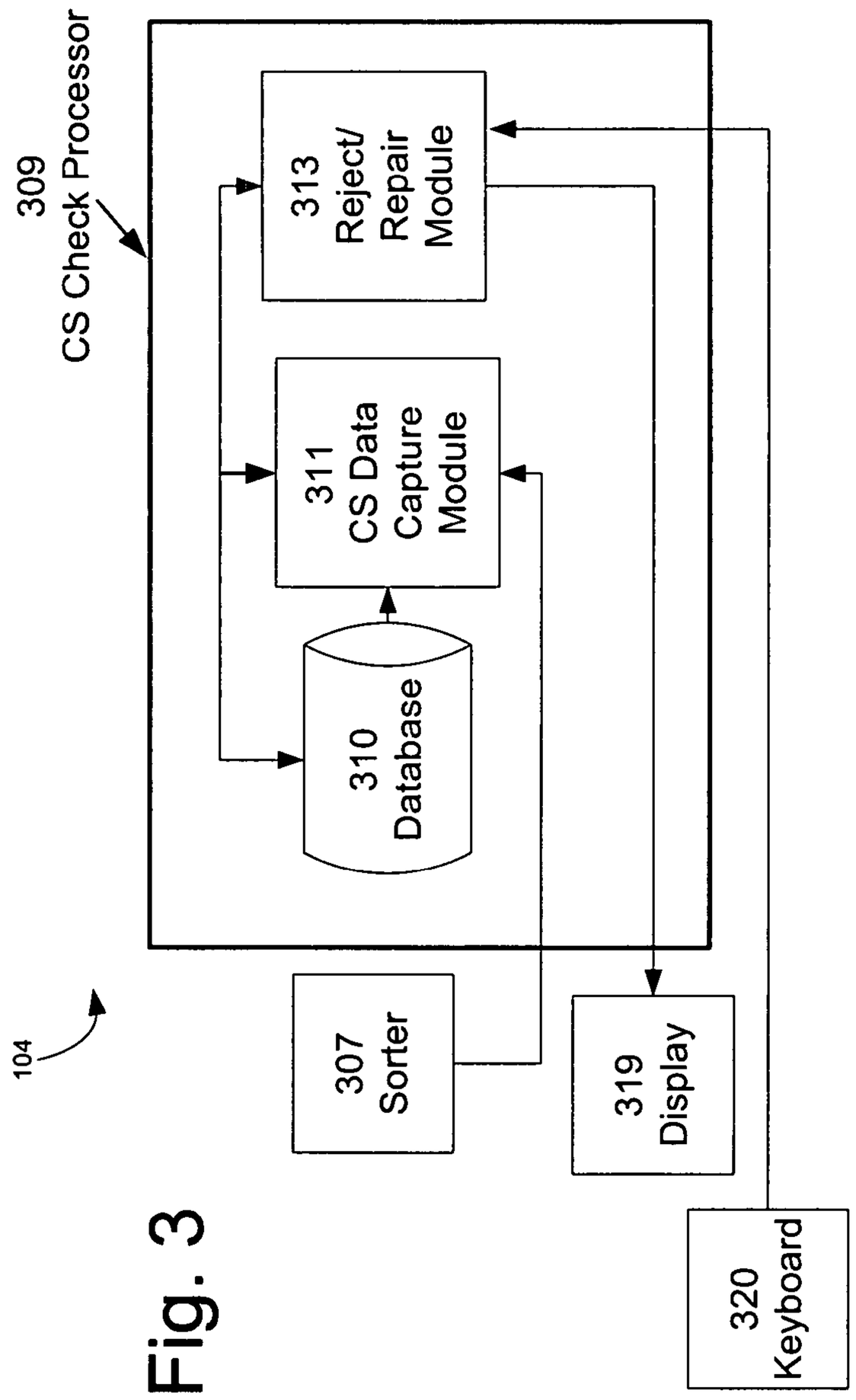

309
CS Check Processor
313
Reject/
Repair
Module
311
CS Data
Capture
Module
310
Database
307
Sorter
319
Display
320
Keyboard
104

Fig. 3

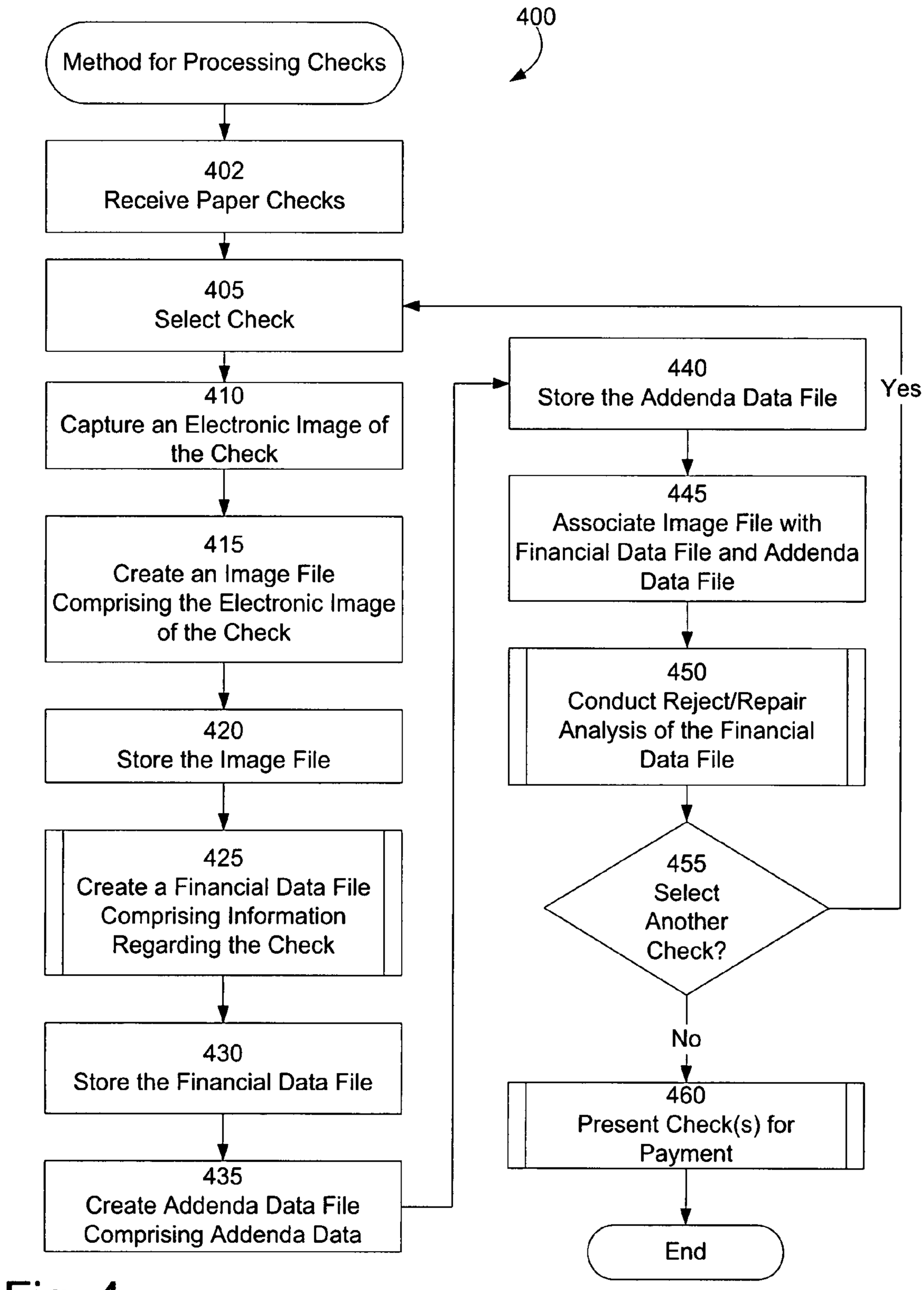

400
Method for Processing Checks
402
Receive Paper Checks
405
Select Check
410
Capture an Electronic Image of the Check
415
Create an Image File Comprising the Electronic Image of the Check
420
Store the Image File
425
Create a Financial Data File Comprising Information Regarding the Check
430
Store the Financial Data File
435
Create Addenda Data File Comprising Addenda Data
440
Store the Addenda Data File
445
Associate Image File with Financial Data File and Addenda Data File
450
Conduct Reject/Repair Analysis of the Financial Data File
455
Select Another Check?
Yes
No
460
Present Check(s) for Payment
End

Fig. 4

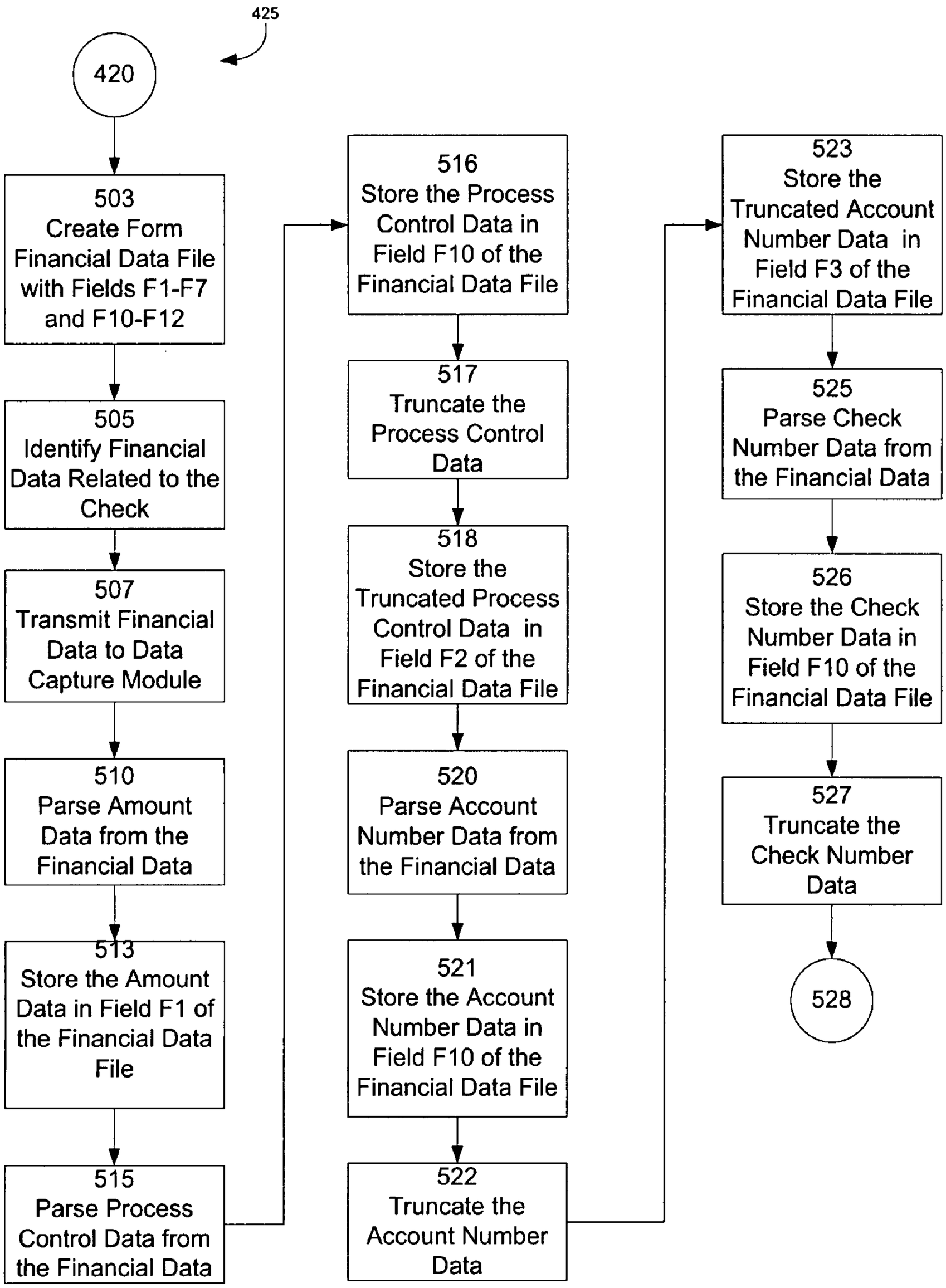

425
420
503
Create Form Financial Data File with Fields F1-F7 and F10-F12
505
Identify Financial Data Related to the Check
507
Transmit Financial Data to Data Capture Module
510
Parse Amount Data from the Financial Data
513
Store the Amount Data in Field F1 of the Financial Data File
515
Parse Process Control Data from the Financial Data
516
Store the Process Control Data in Field F10 of the Financial Data File
517
Truncate the Process Control Data
518
Store the Truncated Process Control Data in Field F2 of the Financial Data File
520
Parse Account Number Data from the Financial Data
521
Store the Account Number Data in Field F10 of the Financial Data File
522
Truncate the Account Number Data
523
Store the Truncated Account Number Data in Field F3 of the Financial Data File
525
Parse Check Number Data from the Financial Data
526
Store the Check Number Data in Field F10 of the Financial Data File
527
Truncate the Check Number Data
528

Fig. 5A

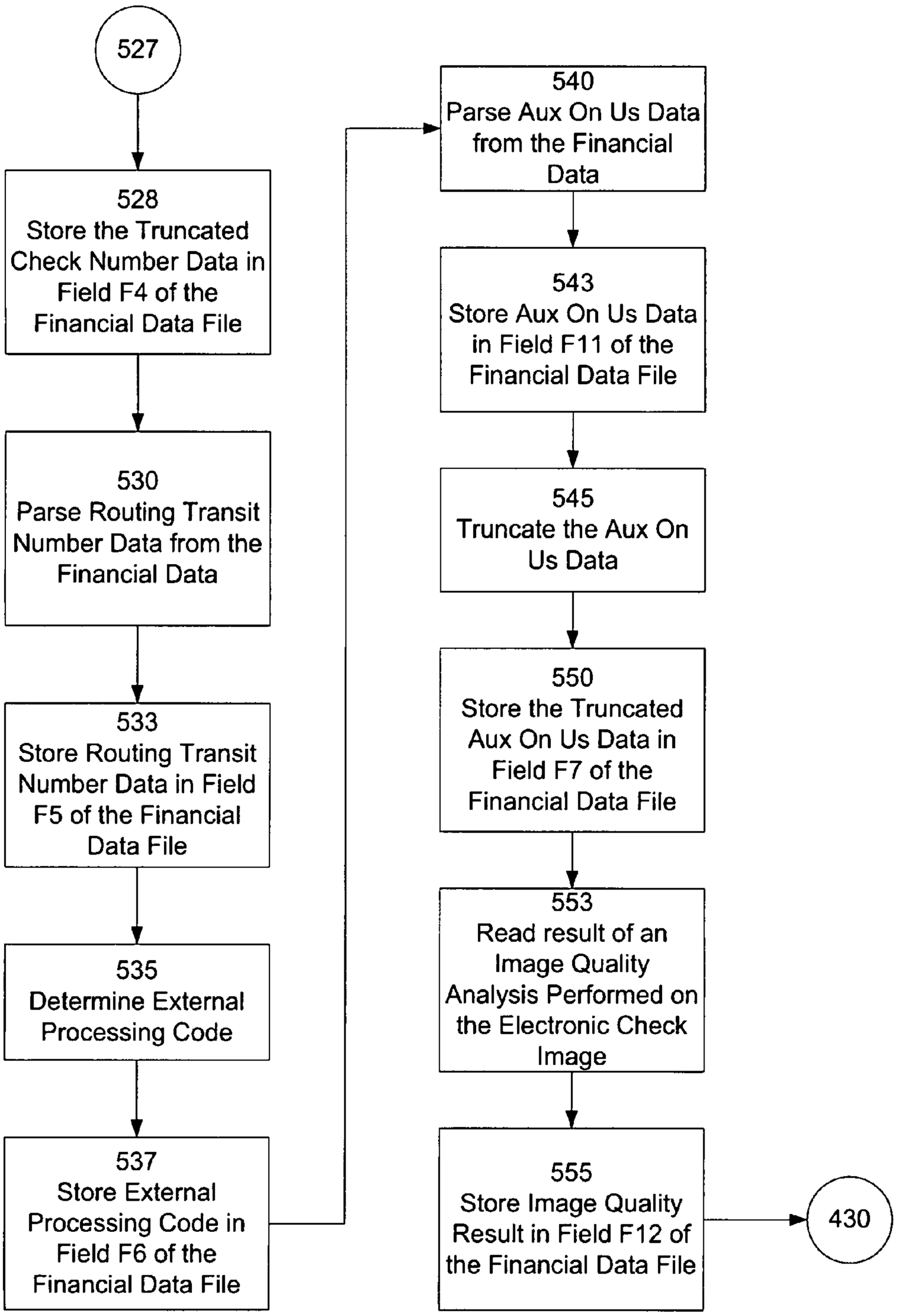

527
528
Store the Truncated Check Number Data in Field F4 of the Financial Data File
530
Parse Routing Transit Number Data from the Financial Data
533
Store Routing Transit Number Data in Field F5 of the Financial Data File
535
Determine External Processing Code
537
Store External Processing Code in Field F6 of the Financial Data File
540
Parse Aux On Us Data from the Financial Data
543
Store Aux On Us Data in Field F11 of the Financial Data File
545
Truncate the Aux On Us Data
550
Store the Truncated Aux On Us Data in Field F7 of the Financial Data File
553
Read result of an Image Quality Analysis Performed on the Electronic Check Image
555
Store Image Quality Result in Field F12 of the Financial Data File
430

Fig. 5B

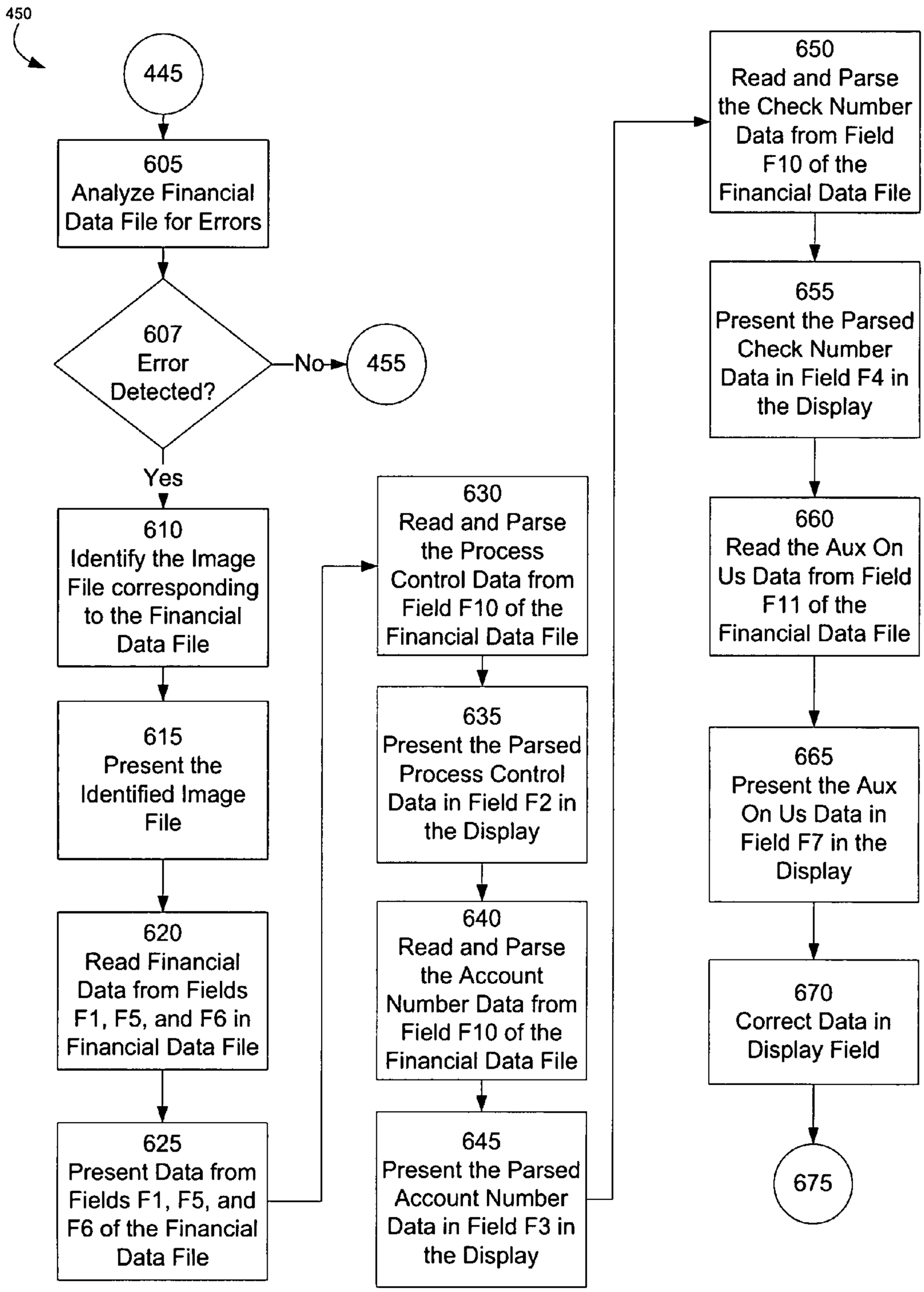

450
445
605
Analyze Financial Data File for Errors
607
Error Detected?
No
455
Yes
610
Identify the Image File corresponding to the Financial Data File
615
Present the Identified Image File
620
Read Financial Data from Fields F1, F5, and F6 in Financial Data File
625
Present Data from Fields F1, F5, and F6 of the Financial Data File
630
Read and Parse the Process Control Data from Field F10 of the Financial Data File
635
Present the Parsed Process Control Data in Field F2 in the Display
640
Read and Parse the Account Number Data from Field F10 of the Financial Data File
645
Present the Parsed Account Number Data in Field F3 in the Display
650
Read and Parse the Check Number Data from Field F10 of the Financial Data File
655
Present the Parsed Check Number Data in Field F4 in the Display
660
Read the Aux On Us Data from Field F11 of the Financial Data File
665
Present the Aux On Us Data in Field F7 in the Display
670
Correct Data in Display Field
675

Fig. 6A

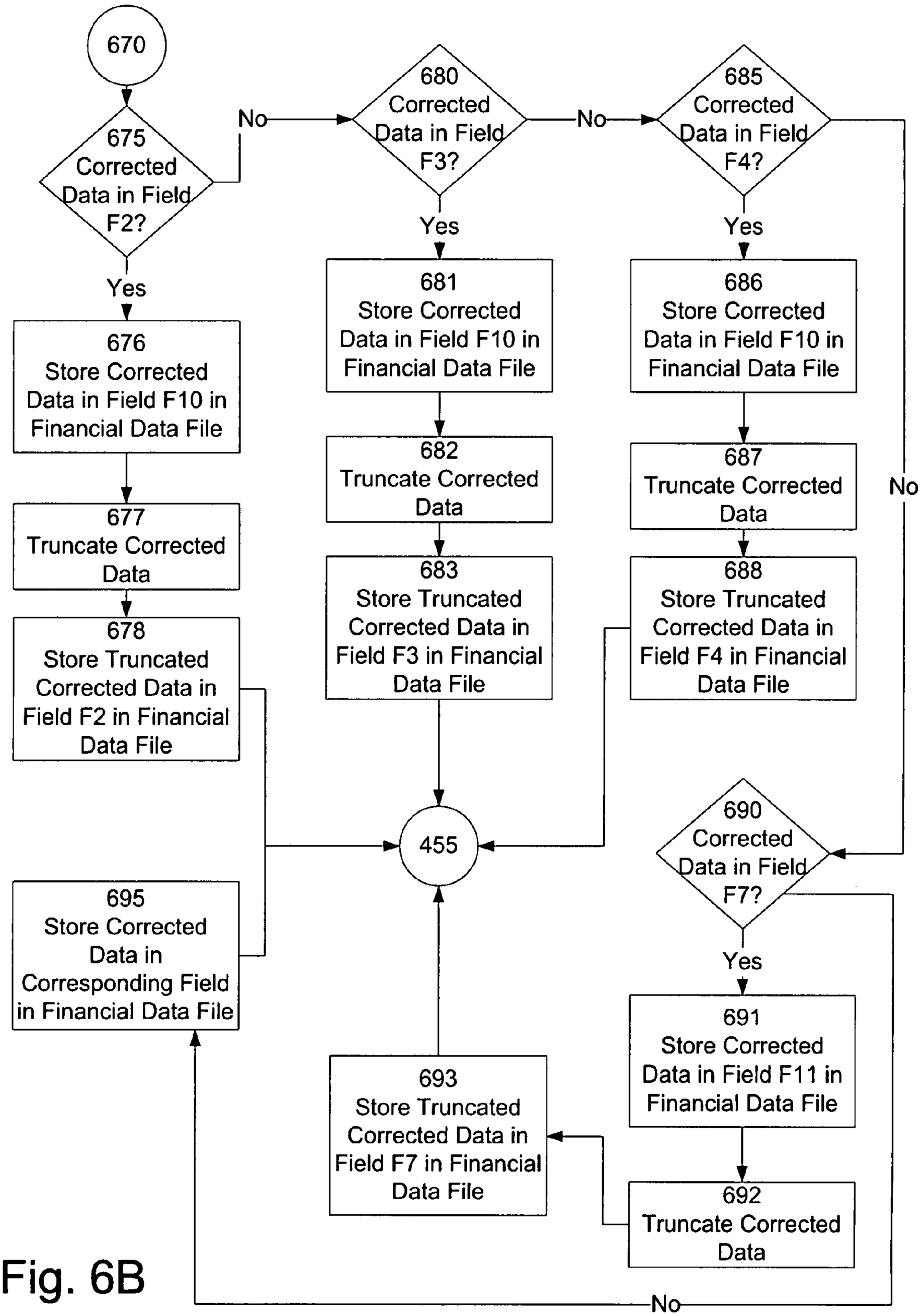

670
675 Corrected Data in Field F2?
No
680 Corrected Data in Field F3?
No
685 Corrected Data in Field F4?
Yes
Yes
Yes
No
676 Store Corrected Data in Field F10 in Financial Data File
677 Truncate Corrected Data
678 Store Truncated Corrected Data in Field F2 in Financial Data File
681 Store Corrected Data in Field F10 in Financial Data File
682 Truncate Corrected Data
683 Store Truncated Corrected Data in Field F3 in Financial Data File
686 Store Corrected Data in Field F10 in Financial Data File
687 Truncate Corrected Data
688 Store Truncated Corrected Data in Field F4 in Financial Data File
455
690 Corrected Data in Field F7?
695 Store Corrected Data in Corresponding Field in Financial Data File
693 Store Truncated Corrected Data in Field F7 in Financial Data File
691 Store Corrected Data in Field F11 in Financial Data File
692 Truncate Corrected Data
No

Fig. 6B

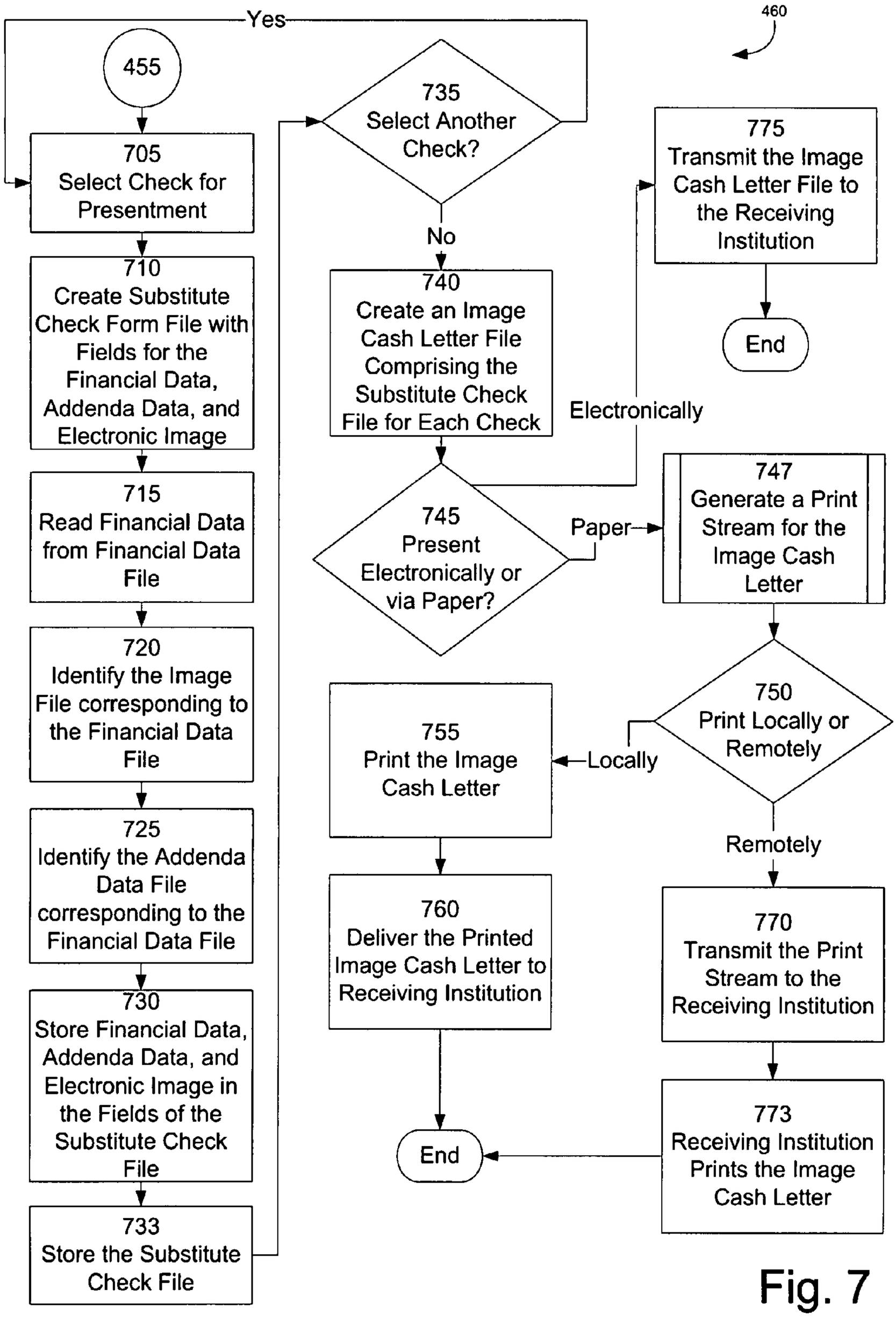
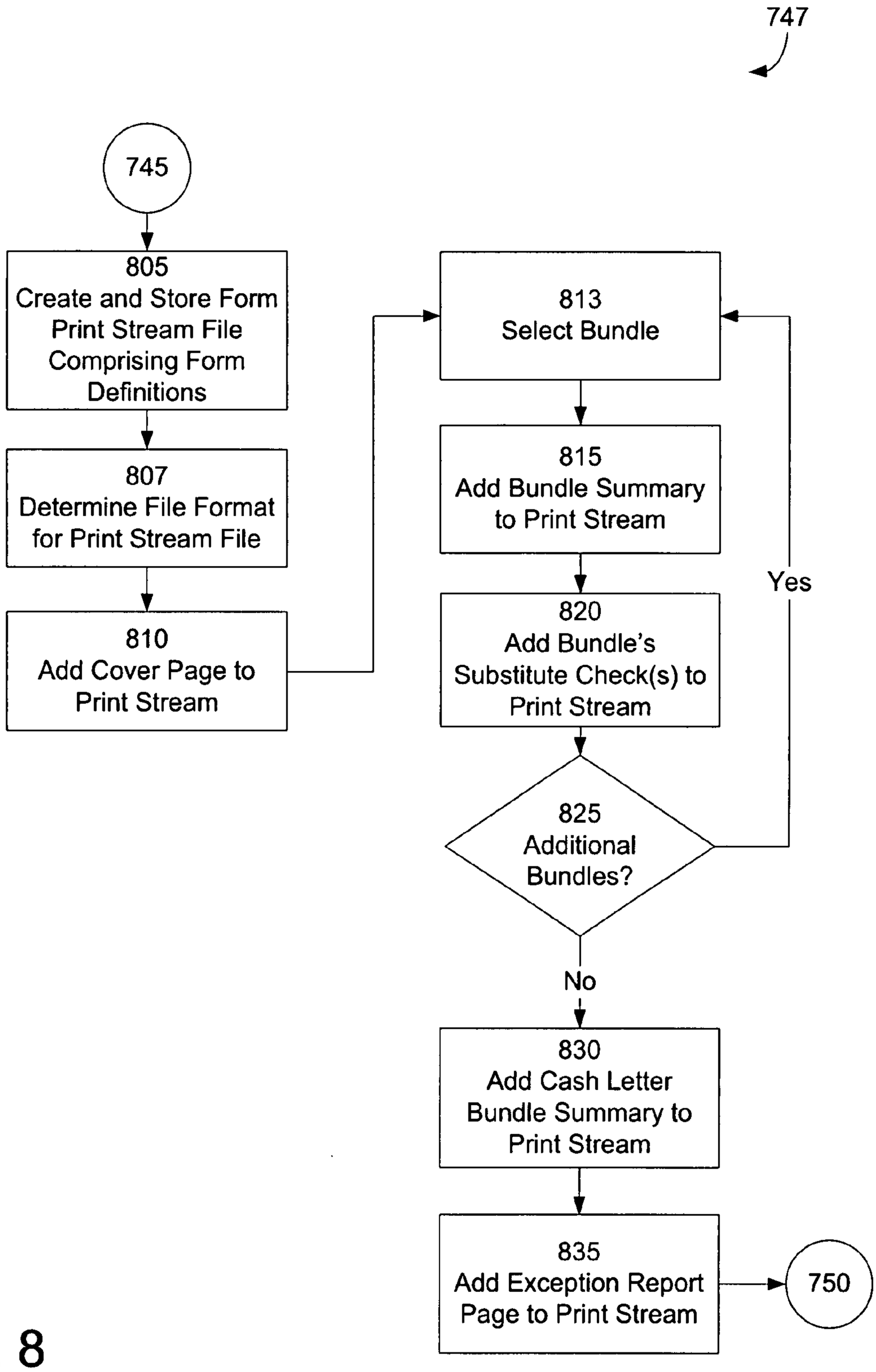

Yes
455
705
Select Check for Presentment
710
Create Substitute Check Form File with Fields for the Financial Data, Addenda Data, and Electronic Image
715
Read Financial Data from Financial Data File
720
Identify the Image File corresponding to the Financial Data File
725
Identify the Addenda Data File corresponding to the Financial Data File
730
Store Financial Data, Addenda Data, and Electronic Image in the Fields of the Substitute Check File
733
Store the Substitute Check File
735
Select Another Check?
No
740
Create an Image Cash Letter File Comprising the Substitute Check File for Each Check
745
Present Electronically or via Paper?
Paper
747
Generate a Print Stream for the Image Cash Letter
750
Print Locally or Remotely
Locally
755
Print the Image Cash Letter
760
Deliver the Printed Image Cash Letter to Receiving Institution
End
Remotely
770
Transmit the Print Stream to the Receiving Institution
773
Receiving Institution Prints the Image Cash Letter
Electronically
460
775
Transmit the Image Cash Letter File to the Receiving Institution
End

Fig. 7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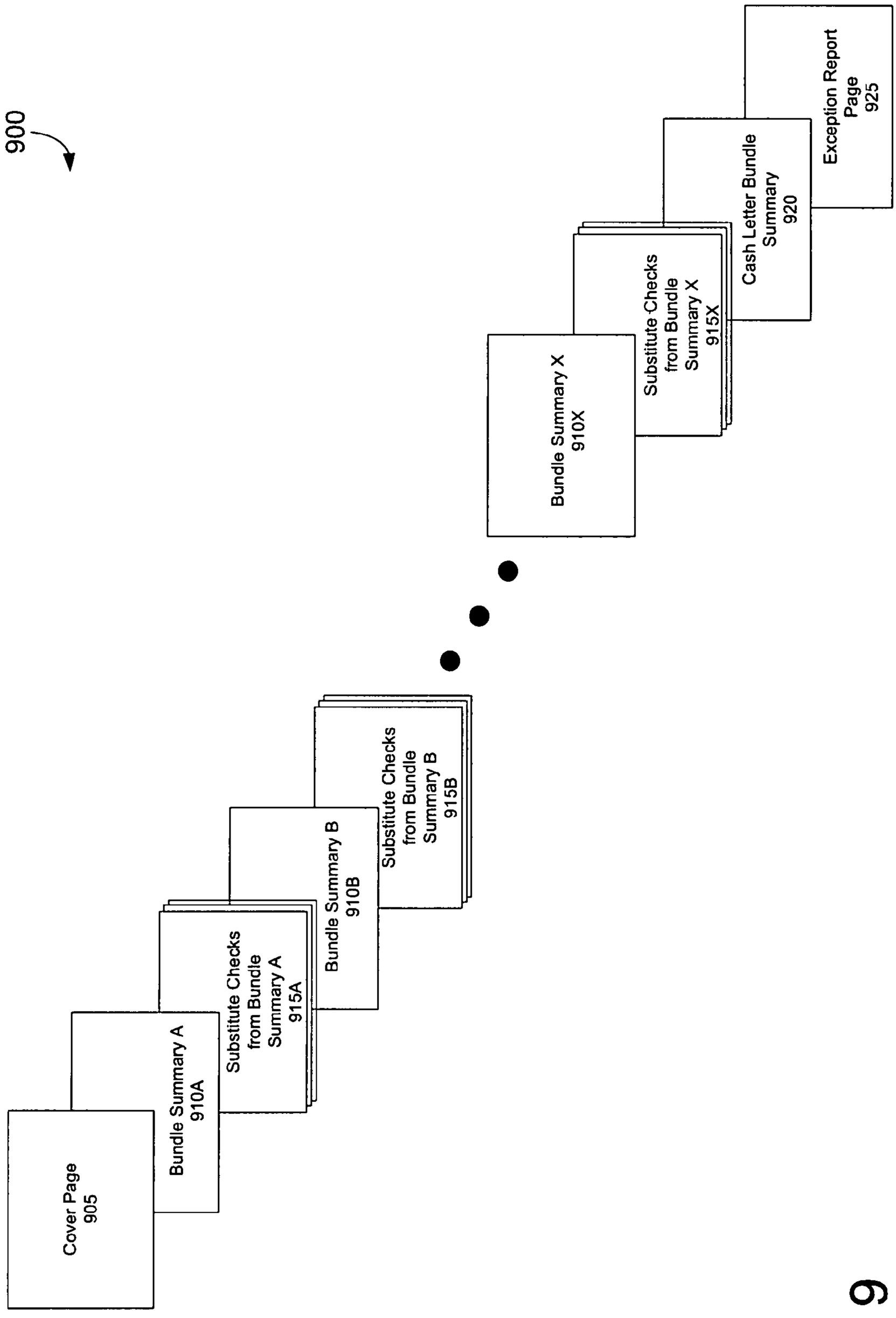
745
805
Create and Store Form Print Stream File Comprising Form Definitions
807
Determine File Format for Print Stream File
810
Add Cover Page to Print Stream
813
Select Bundle
815
Add Bundle Summary to Print Stream
820
Add Bundle's Substitute Check(s) to Print Stream
825
Additional Bundles?
Yes
No
830
Add Cash Letter Bundle Summary to Print Stream
835
Add Exception Report Page to Print Stream
750

Fig. 8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905
Bundle Summary A
910A
Substitute Checks
from Bundle
Summary A
915A
Bundle Summary B
910B
Substitute Checks
from Bundle
Summary B
915B
Bundle Summary X
910X
Substitute Checks
from Bundle
Summary X
915X
Cash Letter Bundle
Summary
920
Exception Report
Page
925

Fig. 9

1000

Cover Page

Input File Name: PBIK1.DAT2.PBS.R1110.N0003.D051212.T16542.dat.10000000047199.12
Output File Name: PBIK1.DAT2.PBS.R1110.N0003.D051212.T16542.dat.10000000047199.12done
Item Count: 4546
IRD Requester Name: null
FED FED FED

1005

TO: **DESTINATION ABA 102000199** **(ANSI 8.3)**
DESTINATION NAME
ADDRESS LINE 1
ADDRESS LINE 2
CITY, STATE AND ZIP CODE

1010

BIN_____ SECTION :_____ COURIER :_____

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Perforations

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Fig. 10

1100

BUNDLE SUMMARY A **RESTART PAGE NUMBER**

FROM ABA (ANSI 9.4) FWD/RET COLLECTION TYPE (ANSI 9.9) CYCLE (ANSI 9.9) BUNDLE CREATION DATE (ANSI 9.60)

FROM 1020000199 COLLECTION TYPE 02 CYCLE 5 MM/DD/YYYY (PRINTED MM/DD/YYYY TIME 14:47) Page 1 of 3

RT	Amount	ISN	RT	Amount	ISN	RT	Amount	ISN
0021-2027	00000112.00	52962657	0021-2027	00000112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657

TO: BANK NAME **SECTION_____BIN_____**
ADDRESS LINE 1
ADDRESS LINE 2
CITY, STATE AND ZIP CODE

BUNDLE ID (ANSI 9.7) TO: EP ABA (ANSI 8.3) BUNDLE TOTAL AMOUNT (ANSI 27.4)

BUNDLE ID 428211900 TO: 101000048 FIRST 112.00 AMOUNT 1,079.10 ← 1110

FIRST ITEM IN BUNDLE/LAST ITEM IN BUNDLE ITEM COUNT (SUM OF ANSI 24.2)

LAST 112.00 ITEMS 162 ← 1105

BUNDLE SUMMARY A

FROM 1020000199 COLLECTION TYPE 02 CYCLE 5 MM/DD/YYYY (PRINTED MM/DD/YYYY TIME 14:47) Page 2 of 3

RT	Amount	ISN	RT	Amount	ISN	RT	Amount	ISN
0021-2027	00000112.00	52962657	0021-2027	00000112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657

TO: BANK NAME **SECTION_____BIN_____**
ADDRESS LINE 1
ADDRESS LINE 2
CITY, STATE AND ZIP CODE

BUNDLE ID 428211900 TO: 101000048 FIRST 112.00 AMOUNT 1,079.10

LAST 112.00 ITEMS 162

Perforations

BUNDLE SUMMARY A

FROM 1020000199 COLLECTION TYPE 02 CYCLE 5 MM/DD/YYYY (PRINTED MM/DD/YYYY TIME 14:47) Page 3 of 3

RT	Amount	ISN	RT	Amount	ISN	RT	Amount	ISN
0021-2027	00000112.00	52962657	0021-2027	00000112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657
0021-2027	112.00	52962657	0021-2027	112.00	52962657	0021-2027	112.00	52962657

TO: BANK NAME **SECTION_____BIN_____**
BANK ADDRESS
CITY, STATE AND ZIP CODE

BUNDLE ID 428211900 TO: 101000048 FIRST 112.00 AMOUNT 1,079.10

LAST 112.00 ITEMS 162

Fig. 11

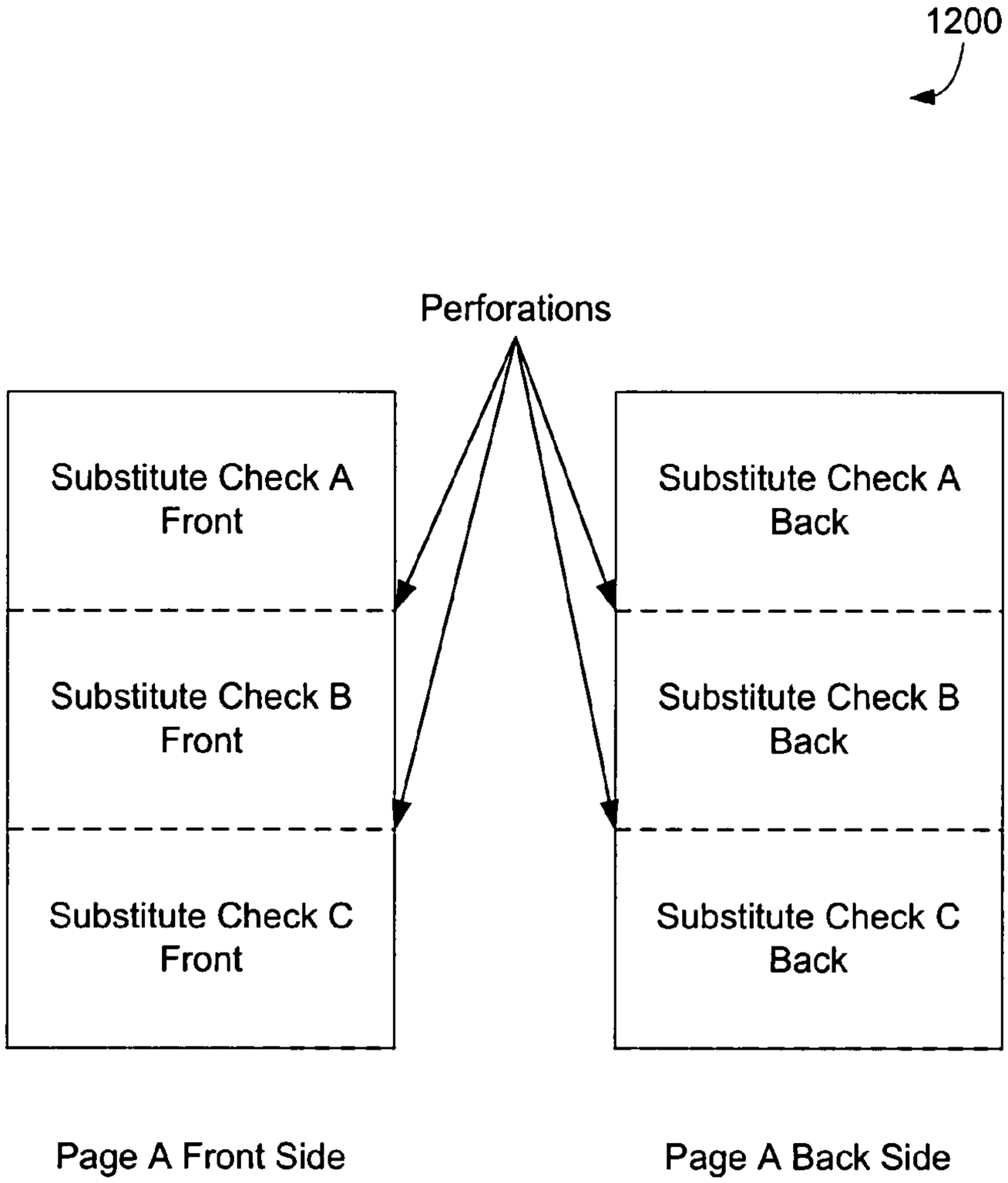
1200
Perforations
Substitute Check A Front
Substitute Check B Front
Substitute Check C Front
Substitute Check A Back
Substitute Check B Back
Substitute Check C Back
Page A Front Side
Page A Back Side

Fig. 12

1300

CASH LETTER BUNDLE SUMMARY

FROM: 101000048 (ANSI 8.4) PRINTED MM/DD/YYYY 14:49 PAGE X OF X
FRB KANSAS CITY CYCLE 5 (ANSI 9.9) CASH LETTER ID (ANSI 8.10)

BUNDLE ID (ANSI 9.7)	BUNDLE NO	ITEM COUNT (ANSI 24.2)	AMOUNT (ANSI 24.3)	BUNDLE ID (ANSI 9.7)	BUNDLE #	ITEM COUNT (ANSI 24.2)	AMOUNT (ANSI 24.3)
0000123455	1	300	193456.00	0123123174	16	125	123123.56
0000123456	2	300	123456.00	0123123175	17	125	123123.56
0000123457	3	300	123456.00	0123123176	18	125	123123.56
0000123458	4	300	123456.00	0123123177	19	125	123123.56
0000123459	5	300	123456.00	0123123178	20	125	123123.56
0000123460	6	300	123456.00	0123123179	21	125	123123.56
0000123461	7	300	123456.00	0123123180	22	125	123123.56
0000123462	8	300	123456.00	0123123181	23	125	123123.56
0000123463	9	300	123456.00	0123123182	24	125	123123.56
0000123464	10	300	123456.00	0123123183	25	125	123123.56
0000123465	11	300	123456.00	0123123184	26	125	123123.56
0000123466	12	300	123456.00	0123123185	27	125	123123.56
0000123467	13	300	123456.00	0123123186	28	125	123123.56
0000123468	14	300	123456.00	0123123187	29	125	123123.56
0000123469	15	300	123456.00	0123123188	30	125	123123.56

CASH LETTER BUNDLE SUMMARY

FROM: 101000048 (ANSI 8.4) PRINTED MM/DD/YYYY 14:49 PAGE X OF X
FRB KANSAS CITY CYCLE 5 (ANSI 9.9) CASH LETTER ID (ANSI 8.10)

BUNDLE ID (ANSI 9.7)	BUNDLE NO	ITEM COUNT (ANSI 24.2)	AMOUNT (ANSI 24.3)	BUNDLE ID (ANSI 9.7)	BUNDLE #	ITEM COUNT (ANSI 24.2)	AMOUNT (ANSI 24.3)
0000123470	31	300	123456.00				
0000123471	32	300	123456.00				
0000123472	33	300	123456.00				
0000123473	34	300	123456.00				
0000123455	35	300	193456.00				
0000123456	36	300	123456.00				
0000123457	37	300	500999.99				

Perforations

CASH LETTER BUNDLE SUMMARY

*********** COLLECTION TYPE - 01 **********

BIN_____ SECTION :_____ COURIER :_____

FROM: 101000048
FRB KANSAS CITY

TO: DESTINATION ABA 102000199 (ANSI 8.3)
DESTINATION NAME
ADDRESS LINE 1
ADDRESS LINE 2
CITY, STATE AND ZIP CODE

CASH LETTER TOTALS			1ST BUNDLE	193,456.00
ITEMS	4546 ← 1305		LAST BUNDLE	500,999.99
AMOUNT	1,777,456.99 ← 1310		CYCLE DATE	MM/DD/YY (ANSI 8.5)
BUNDLES	46		CASH LETTER ID	12345678 (ANSI 8.10)
			FED WORK TYPE	(ANSI 8.13)

Fig. 13

1400

RESTART PAGE NUMBER

******** EXCEPTION REPORT PAGE ********

IRD Print Summary PAGE X OF X

Failed IRD Print Listing

RT	Sequence	Amount	Bundle ID	Reason
241076770	007858551424	100.00	4242119000	Digit Error in Required Field
451478524	008348525452	4432.00	5845844581	No Image Data
467854545	014525841258	3110.00	5845844581	No Image Data

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Perforations

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Fig. 14

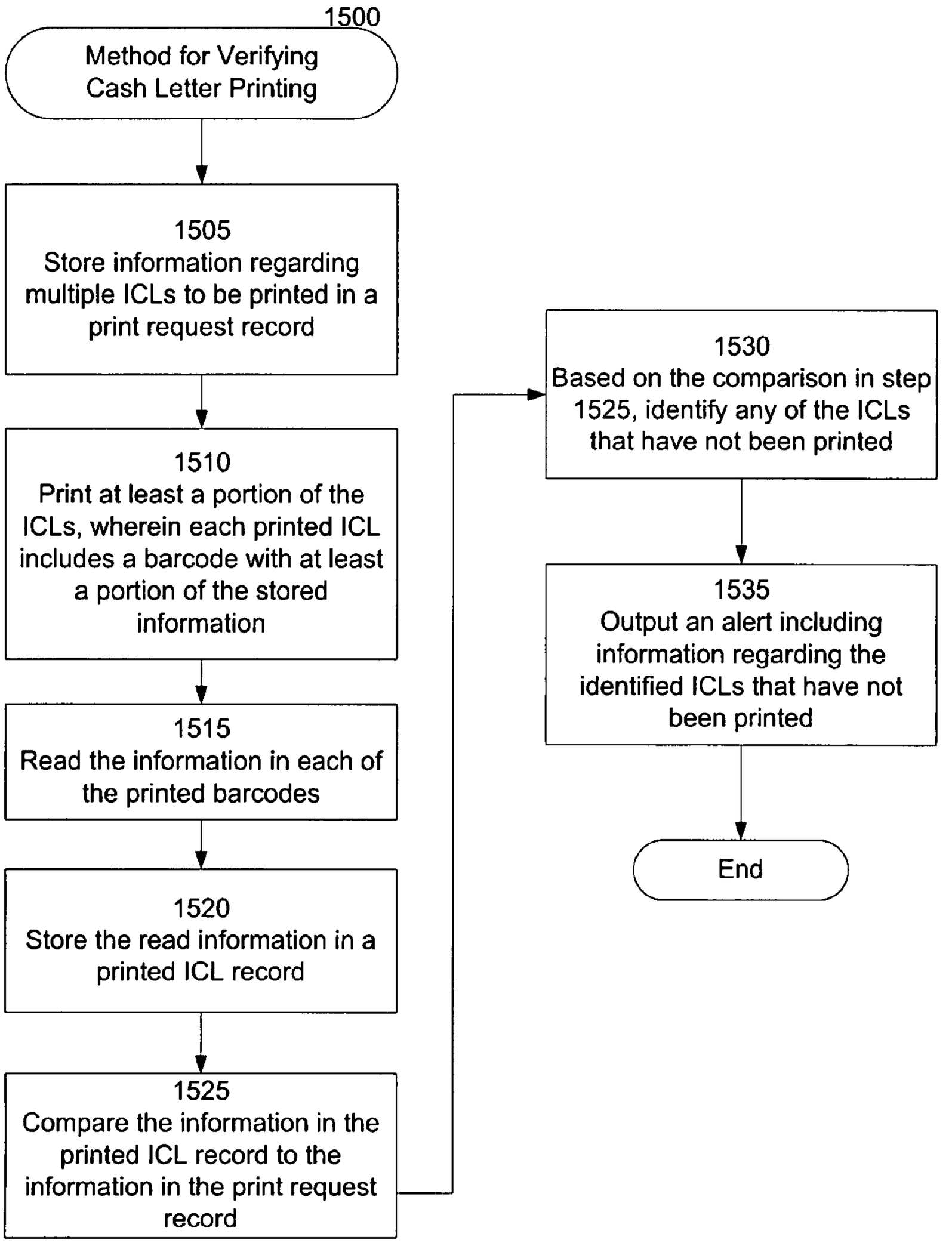
1500
Method for Verifying Cash Letter Printing
1505
Store information regarding multiple ICLs to be printed in a print request record
1510
Print at least a portion of the ICLs, wherein each printed ICL includes a barcode with at least a portion of the stored information
1515
Read the information in each of the printed barcodes
1520
Store the read information in a printed ICL record
1525
Compare the information in the printed ICL record to the information in the print request record
1530
Based on the comparison in step 1525, identify any of the ICLs that have not been printed
1535
Output an alert including information regarding the identified ICLs that have not been printed
End

Fig. 15

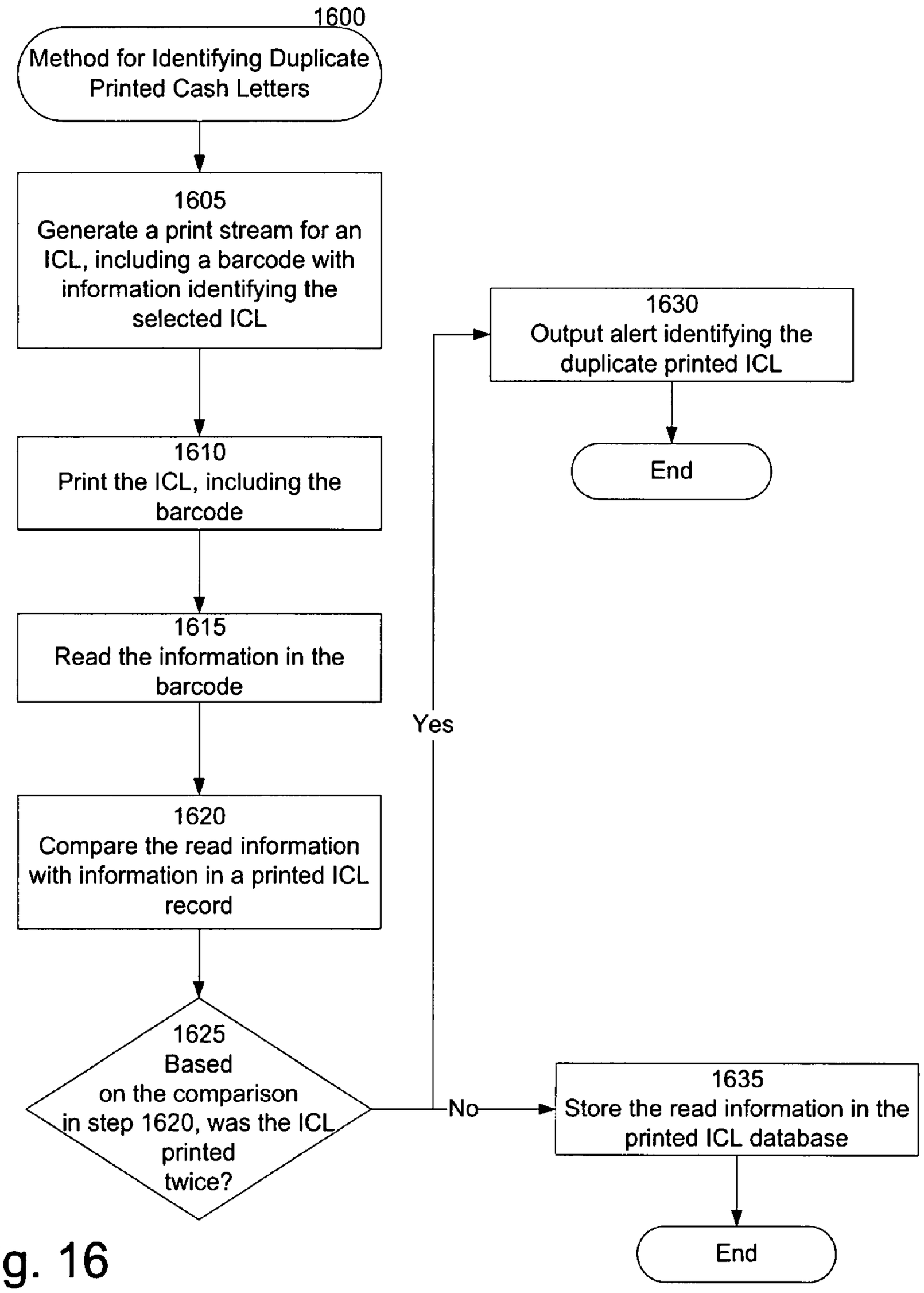
1600
Method for Identifying Duplicate Printed Cash Letters
1605
Generate a print stream for an ICL, including a barcode with information identifying the selected ICL
1610
Print the ICL, including the barcode
1615
Read the information in the barcode
1620
Compare the read information with information in a printed ICL record
1625
Based on the comparison in step 1620, was the ICL printed twice?
Yes
1630
Output alert identifying the duplicate printed ICL
End
No
1635
Store the read information in the printed ICL database
End

Fig. 16

IDENTIFYING DUPLICATE PRINTED PAPER CASH LETTERS

RELATED PATENT APPLICATIONS

This patent application is related to U.S. patent application Ser. No. 11/362,344, entitled "Cash Letter Print Streams With Audit Data," filed Feb. 22, 2006, which claims priority under 35 U.S.C. §119 to U.S. Provisional Patent Application No. 60/710,346, entitled "Image Replacement Document (IRD) Print Streams with Real-Time Audit Data," filed Aug. 22, 2005, and U.S. Provisional Patent Application No. 60/657,142, entitled "Check Processing Using Substitute Check Images," filed Feb. 28, 2005. This patent application also is related to co-pending U.S. patent application Ser. No. 11/982,950, entitled "Cash Letter Print Verification," filed Nov. 6, 2007. The complete disclosure of the above-identified applications is hereby fully incorporated herein by reference.

FIELD OF THE INVENTION

The invention relates generally to monitoring paper cash letter production and more particularly to verifying cash letter printing and identifying duplicate printed paper cash letters.

BACKGROUND OF THE INVENTION

Effective Oct. 28, 2004, the Check Clearing for the 21st Century Act ("the Act") improves the ability of banks to use electronic images of paper checks by, for example, submitting those images, along with associated information, for electronic processing. Under the Act, if a receiving financial institution ("RI") or its customer requires a paper check, a paper image replacement document ("IRD"), such as a paper "substitute check," may be created from an electronic check image and associated electronic information. Under the Act, a substitute check meeting specified requirements is the legal equivalent of an original paper check, and an RI is required to accept the substitute check for payment. This process enables banks to reduce the costs and inconveniences associated with physically handling and transporting original paper checks.

Under the Act, the substitute check must be essentially an exact copy of the original paper check to be the legal equivalent of the original paper check. In particular, the substitute check must include an exact copy of all of the Magnetic Ink Character Recognition ("MICR") data provided on the original paper check and all check endorsements.

The terms "substitute check" and "IRD" generally are used interchangeably herein to refer to any electronic or paper document that can be used for electronic payment processing purposes, whether or not the document is the legal equivalent of a paper check negotiable instrument. The terms "bank" and "RI" generally are used herein to refer to any party performing conventional or electronic check processing at any stage, including depositing and receiving institutions, their non-bank subsidiaries and affiliates, and any non-bank third party agents that provide processing services to banks.

A "cash letter" is a collection of one or more bundles of checks and/or IRDs (interchangeably collectively or individually referred to herein as "items") that can be transmitted from a bank to an RI. Further, as used herein, a "cash letter" can comprise return items. A cash letter typically includes a cover page comprising information regarding the cash letter's contents. For example, the cover page can comprise the number of items in the cash letter, information identifying the transmitting bank, and/or information identifying the RI. For each bundle of items in the cash letter, the cash letter can

include a bundle summary comprising the number of items in the bundle, the value of each of the items in the bundle, and the total value of all items in the bundle. The cash letter also can include a cash letter bundle summary comprising a total of the value of all the bundles in the cash letter.

A cash letter in electronic form, comprising images of the items and associated financial data, is referred to herein as an "image cash letter" or "ICL." A cash letter in paper form, comprising paper items, is referred to herein as a "paper cash letter." The cover page, bundle summaries, and cash letter bundle summary contained within a cash letter, whether paper or electronic, are collectively referred to herein as "audit data."

A bank can submit a cash letter to an RI either in electronic or paper form. For example, the bank can submit a paper cash letter to an RI via conventional paper transport means, such as mail or truck delivery. Alternatively, the bank can communicate an ICL to an RI via an electronic data transport means, such as a distributed computer network.

Conventionally, preparation of a paper cash letter, either by the submitting bank or the RI, generally required: (1) aggregating one or more bundles of paper items (either original paper checks, substitute checks, or other printed paper items); (2) printing a bundle summary for each bundle; (3) printing a cash letter bundle summary for the cash letter; (4) printing a cover page for the cash letter; and (5) assembling the cash letter by matching the items to their respective bundle summaries, matching the bundles to the cash letter bundle summary, and matching the items, bundle summaries, and cash letter bundle summary to the cover page. Such preparation involves many inefficiencies, most notably the delay involved in manually matching the items, bundle summaries, cash letter bundle summary, and cover page together to assemble the paper cash letter.

A recent approach for overcoming these inefficiencies includes producing print streams for efficiently generating properly formatted and ordered paper cash letters with substitute checks and audit data. Certain exemplary methods and systems for producing such print streams are described in co-pending U.S. patent application Ser. No. 11/362,344, entitled "Cash Letter Print Streams With Audit Data," the disclosure of which is hereby fully incorporated herein by reference. To date, banks have been unable to monitor the production of these print streams or the output of the corresponding paper cash letters.

In the traditional, paper processing arena, each paper cash letter component could be seen and touched throughout processing. Determining whether a paper cash letter was produced simply required looking in one or more trays at a bank processing station. Because Check 21 processing takes place electronically, banks do not have physical points at which they can make such determinations. Oftentimes, this inability results in failure of some paper cash letters to be produced and other paper cash letters to be printed two or more times.

Thus, a need exists in the art for a system and method for monitoring paper cash letter printing. Specifically, a need exists in the art for a system and method for verifying paper cash letter printing and for identifying duplicate printed paper cash letters.

SUMMARY OF THE INVENTION

The invention provides systems and methods for efficiently monitoring paper cash letter printing. Specifically, the invention provides systems and methods for verifying cash letter printing and identifying duplicate printed paper cash letters

In a first record, a check presentment module stores information regarding each of multiple ICLs to be printed. For example, the stored information can include information uniquely identifying each of the ICLs, such as a total value of items in the cash letter, an American Bankers Association ("ABA") number of a bank that will receive a printed copy of the cash letter, a total number of item bundles in the cash letter, and a total number of items in the cash letter. The check presentment module generates a print stream for printing each of the ICLs.

Included within the print stream is information for printing a machine-readable identifier, such as a barcode, for each of the ICLs. The machine-readable identifier includes information uniquely identifying the ICL associated therewith. For example, the machine-readable identifier can include at least a portion of the information stored in the first record.

At least a portion of the ICLs are printed. Each printed ICL includes its corresponding machine-readable identifier. For example, a cover page of each printed ICL can include a barcode associated with the printed ICL.

Upon printing, information from each of the machine-readable identifiers is read. The check presentment module stores information from the machine-readable identifiers in a second record. To determine whether all of the ICLs have been printed, the check presentment module compares the information stored in the first record with the information stored in the second record. For example, if the first record includes information regarding an ICL, which is not identified in the second record, then the check presentment module can determine that the ICL has not been printed.

In certain exemplary embodiments, the check presentment module can output an alert to notify an operator that the ICL has not been printed. For example, the alert can include information uniquely identifying the ICL.

To determine whether a printed ICL is a duplicate, i.e., whether the ICL has been printed two or more times, a check presentment module can compare information from a machine-readable identifier of the printed ICL with information stored in the second record. If information identifying the ICL already exists in the second record, then the check presentment module can determine that the ICL already has been printed, and thus, is a duplicate. In certain exemplary embodiments, the check presentment module can output an alert to notify an operator that the ICL is a duplicate. For example, the alert can include information uniquely identifying the ICL.

These and other aspects, objects, features, and advantages of the invention will become apparent to those skilled in the art upon consideration of the following detailed description of illustrated exemplary embodiments, which include the best mode of carrying out the invention as presently perceived.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram depicting a system for processing checks, according to an exemplary embodiment of the invention.

FIG. **2** is a block diagram depicting a depositing institution of a system for processing checks, according to an exemplary embodiment of the invention.

FIG. **3** is a block diagram depicting a capture site of a system for processing checks, according to an exemplary embodiment of the invention.

FIG. **4** is a flow chart depicting a method for processing checks, according to an exemplary embodiment of the invention.

FIG. **5**A and FIG. **5**B are flow charts depicting a method for creating a financial data file comprising expanded mass data sets, according to an exemplary embodiment of the invention

FIG. **6**A and FIG. **6**B are flow charts depicting a method for conducting a reject/repair analysis of a financial data file using expanded mass data sets of the financial data file, according to an exemplary embodiment of the invention.

FIG. **7** is a flow chart depicting a method for presenting a check for payment, according to an exemplary embodiment of the invention.

FIG. **8** is a flow chart depicting a method for generating a cash letter print stream, according to an exemplary embodiment of the invention.

FIG. **9** is a block diagram depicting a print stream generated in accordance with an exemplary embodiment of the invention.

FIG. **10** is a block diagram depicting a cover page printed from a print stream generated in accordance with an exemplary embodiment of the invention.

FIG. **11** is a block diagram depicting a bundle summary page printed from a print stream generated in accordance with an exemplary embodiment of the invention.

FIG. **12** is a block diagram depicting a substitute check page printed from a print stream generated in accordance with an exemplary embodiment of the invention.

FIG. **13** is a block diagram depicting a cash letter bundle summary page printed from a print stream generated in accordance with an exemplary embodiment of the invention.

FIG. **14** is a block diagram depicting an exception report page printed from a print stream generated in accordance with an exemplary embodiment of the invention.

FIG. **15** is a flow chart depicting a method for verifying cash letter printing, according to an exemplary embodiment of the invention.

FIG. **16** is a flow chart depicting a method for identifying duplicate printed paper cash letters, according to an exemplary embodiment of the invention.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

The invention is directed to systems and methods for processing checks under the Check Processing Under the Check Clearing For The 21st Century Act ("the Act"). In particular, the invention is directed to systems and methods for producing print streams for efficiently generating properly formatted and ordered paper cash letters comprising substitute checks and audit data. By using expanded fields (also referred to herein as "expanded mass data sets") of a financial data file, each substitute check can comprise all of the MICR data and addenda data provided on a corresponding, original paper check. Thus, each substitute check can comprise all of the information necessary to comply with the requirements of the Act.

In accordance with an exemplary embodiment of the invention, a print stream file can comprise electronic form definitions for each document to be printed in the cash letter. For example, the cash letter documents can include a cover page, one or more bundles of substitute checks, a bundle summary for each substitute check bundle, a cash letter bundle summary, and/or an exception report page. A check presentment module can parse and store information from an electronic image cash letter file in data fields of the print stream file's electronic form definitions. Printing the information in the print stream file results in a properly formatted and ordered paper cash letter comprising substitute checks and audit data. The audit data comprises the cover page, bundle sum-

mary(ies), cash letter bundle summary, and/or exception report page, which can each detail the documents printed concurrently therewith.

The invention comprises a computer program that embodies the functions described herein and illustrated in the appended flow charts. However, it should be apparent that there could be many different ways of implementing the invention in computer programming, and the invention should not be construed as limited to any one set of computer program instructions. Further, a skilled programmer would be able to write such a computer program to implement an embodiment of the disclosed invention based on the flow charts and associated description in the application text. Therefore, disclosure of a particular set of program code instructions is not considered necessary for an adequate understanding of how to make and use the invention. The inventive functionality of the claimed computer program will be explained in more detail in the following description read in conjunction with the figures illustrating the program flow.

Turning now to the drawings, in which like numerals indicate like elements throughout the figures, exemplary embodiments of the invention are described in detail.

An exemplary system for processing checks will now be described with reference to FIGS. **1-3**. FIG. **1** is a block diagram depicting a system **100** for processing checks, according to an exemplary embodiment of the invention. FIG. **2** is a block diagram depicting a depositing institution **103** of the system **100**, according to an exemplary embodiment of the invention. FIG. **3** is a block diagram depicting a capture site **104** of the system **100**, according to an exemplary embodiment of the invention.

The system **100** comprises various financial institutions and computer systems involved in check processing. In particular, the system **100** comprises the depositing institution **103**, the capture site **104**, a check processing site **105**, and a receiving institution **125**. The depositing institution **103** collects paper checks from a customer. Then, the depositing institution **103** can bundle the paper checks in one or more paper cash letters. Each paper cash letter can comprise one or more bundles of original paper checks and paper image replacement documents, such as substitute checks. The depositing institution **103** forwards the paper checks to the capture site **104** or the check processing site **105** for electronic processing.

Alternatively, the depositing institution **103** can itself generate an electronic image cash letter ("ICL") based on the paper checks. The depositing institution **103** can forward the generated ICL to the check processing site **105** for electronic processing. The ICL can be an electronic file that complies with the American National Standards Institute Specifications for Electronic Exchange of Check and Image Data (ANSI X9.37/X9.100), or other appropriate industry standards, as may change from time to time. The ICL can comprise, for each paper check, one or more electronic images of the check, all of the complete MICR data provided on the check, and additional financial data related to the check.

The ICL can further comprise a series of records related to the checks. For example, for each bundle of checks in the ICL, the ICL can include a bundle summary control record comprising information about the bundle, such as a bundle identification number, the number of items in the bundle, the value of each of the checks in the bundle, and the total value of all the checks in the bundle. The ICL also can comprise a cover page control record comprising information about the origin and destination of the ICL, and a cash letter bundle summary control record comprising a summary of all bundle summary control records in the ICL.

Thus, in alternative embodiments of the invention, the depositing institution **103** can (1) generate an ICL for received checks and forward the ICL to the check processing site **105**, (2) forward received paper checks to the capture site **104**, or (3) forward received paper checks to the check processing site **105**.

The following description discusses an embodiment in which the depositing institution **103** forwards received paper checks to the check processing site **105** via a conventional paper cash letter. The check processing site **105** receives the paper checks from the depositing institution **103**. A sorter **107** of the check processing site **105** electronically captures financial data from each received paper check. The sorter **107** comprises an image capture device (not shown), such as a scanner or camera, which captures at least one electronic image of each check. For example, the sorter **107** can capture, for each check, an image of the front of the check and an image of the back of the check. Upon image capture, the sorter **107** forwards each image to a data capture module **111** of a check processor **109** for further processing. The data capture module **111** stores the electronic image(s) in one or more image files, which the data capture module **111** maintains in an image file database **113** of the check processor **109**. In one exemplary embodiment of the invention, the sorter **107** and the data capture module **111** can be part of the same physical unit.

The sorter **107** further comprises a MICR reader (not shown) that reads the MICR data from each check. Upon reading the MICR data, the sorter **107** identifies additional financial data related to the check, which is incidental to the processing of the check. For example, the sorter **107** can identify a unique item sequence number, a check processing site identifier, a processing date, a check amount, and/or a routing transit number of the depositing institution **103**. The MICR data and additional financial data are collectively referred to herein as "financial data." The sorter **107** forwards the financial data to the data capture module **111** for further processing.

The data capture module **111** stores a form financial data file with multiple fields. For example, the data capture module **111** can store the form financial data file with data fields labeled F**1**-F**7** and F**10**-F**12**. The data capture module **111** reads the financial data from the sorter **107** and parses and stores portions of the financial data in each of the data fields. For example, the data stored in fields F**1**-F**7** of the financial data file can comprise the check amount stored in field F**1**, process control data stored in field F**2**, an account number stored in field F**3**, a check number stored in field F**4**, a payor bank's routing transit number stored in field F**5**, an external processing code stored in field F**6**, and "auxiliary on us" data stored in field F**7**. Fields F**2**-F**4** are collectively referred to herein as the "on us field." The data in the on us field is referred to herein as "on us data."

Each of fields F**1**-F**7** is respectively designed to accommodate a set number of characters without extraneous information such as dashes and field delimiters or other items. Accordingly, prior to storing the financial data in the respective fields of the financial data file, the data capture module **111** truncates all extraneous information and all data beyond the allowed number of characters in each of those fields. The data capture module **111** typically truncates the data in fields F**2**, F**3**, F**4**, and F**7**.

The data stored in fields F**10**-F**11** can comprise untruncated financial data. For example, the data stored in fields F**10**-F**11** can comprise untruncated on us data stored in field F**10** and untruncated auxiliary on us data stored in field F**11**.

Thus, the fields of the financial data file can comprise all of the MICR data from the original paper check.

The check processor **109** also comprises an image quality analysis module **110**, which can evaluate the quality of each captured check image. Certain exemplary systems and methods for performing such an evaluation are described in co-pending U.S. patent application Ser. No. 11/079,120, entitled "Assessing Electronic Image Quality," the disclosure of which is hereby fully incorporated herein by reference. The image quality analysis module **110** communicates the results of the evaluation to the data capture module **111**. The data capture module **111** stores the image quality analysis results in a field of the financial data file, such as field F**12**. Then, the data capture module **111** stores the financial data file in a financial data file database **114** of the check processor **109**.

In one embodiment of the invention, the image quality analysis module **110** can store additional data related to the image quality analysis results in field F**12** of the financial data file. For example, the image quality analysis module **110** can store a reason for an image quality analysis result in field F**12**. In addition, an indicator can be stored in field **12** to indicate whether the image(s) corresponding to the data in field F**12** has(have) corresponding addenda data.

The functionality of the data capture module **111** is described in more detail below with reference to FIGS. **5**A and **5**B.

The check processor **109** further comprises an addenda data module **112**, which generates and/or captures electronic addenda data for each check. For example, the addenda data can comprise a bank endorsement. The addenda data module **112** inputs the addenda data into one or more addenda data files. The addenda data module **112** stores the addenda data file(s) in an addenda data file database **115** of the check processor **109**.

For each check, the data capture module **111** associates the corresponding image file(s), financial data file, and addenda data file(s) for further processing. For example, the data capture module **111** can associate the image file(s), the financial data file, and the addenda data file(s) for a check with a common sequence number, identification number, or other suitable data link known in the art.

The check processor **109** further comprises a reject/repair module **118**, which can verify, for each check, the contents of the image file(s) and the financial data file. The reject/repair module **118** analyzes the financial data file for errors. For example, the reject/repair module **118** might detect an error if a field of the financial data file is empty or if it comprises a character or string that is not in the proper format. If an error is detected, the reject/repair module **118** presents the image file(s) and certain of the associated financial data from the financial data file on a display **119** for viewing by a user. In an exemplary embodiment, the display **119** can be a computer monitor or another device suitable for presenting images and textual data to the user.

The reject/repair module **118** presents the financial data from fields F**1**, F**5**, and F**6** of the financial data file on the display **119**. The reject/repair module **118** also presents the complete on us data from field F**10** in place of the truncated on us data in data fields F**2**, F**3**, and F**4** on the display **119**. The reject/repair module **118** further presents the complete auxiliary on us data from field F**11** in place of the truncated auxiliary on us data in data field F**7** on the display **119**. Thus, the display **119** presents the user with the complete MICR data from the original paper check.

The user compares the presented financial data with the presented image file(s) and corrects any errors in the financial data via a keyboard **120** or other suitable input device known in the art. For example, where a displayed data field is empty or incorrect but the displayed image of the check comprises data corresponding to the data field, the user can enter the financial data from the displayed image into the displayed data field.

Then, the reject/repair module **118** stores the complete, corrected auxiliary on us data displayed in field F**7** in field F**11** of the financial data file. The reject/repair module **118** further stores the complete, corrected on us data displayed in fields F**2**, F**3**, and F**4** in field F**10** of the financial data file. In one embodiment of the invention, the reject/repair module **118** truncates the data in each corrected field, in accordance with the requirements of each of data fields F**2**, F**3**, F**4**, and F**7**. Then, the reject/repair module **118** stores the corrected, truncated data in the corresponding fields of the financial data file.

The functionality of the reject/repair module **118** is described in more detail below with reference to FIGS. **6**A and **6**B.

The check processor **109** further comprises a check presentment module **116**, which is operable to present each received check to the receiving institution **125** for payment. The check presentment module **116** can generate a substitute check file for each check. In an exemplary embodiment, the substitute check file can comprise the check's electronic image(s), the check's financial data, and the check's addenda data. The check presentment module **116** stores the substitute check file in a substitute check database **108** of the check processor **109**.

The check presentment module **116** can create at least one ICL comprising the substitute check file(s). Depending on the preferences of the receiving institution **125**, the check presentment module **116** can present the ICL electronically or via paper. For example, the check presentment module **116** can electronically transmit the ICL via a network (not illustrated) to an RI computer **126** of the receiving institution **125**.

Alternatively, the ICL can be locally or remotely printed for paper delivery. For example, the check presentment module **116** can locally print the ICL on a printer **117** of the check processing site **105**. The check presentment module **116** can prepare a print stream comprising the ICL. The check presentment module **116** can transmit the print stream to the printer **117** for printing. An operator at the check processing site **105** can collect one or more of the printed ICLs for delivery to the receiving institution **125**. Alternatively, the check presentment module **116** can generate, and transmit to the receiving institution **125**, a print stream by which the receiving institution **125** can print the ICL on an RI Printer **127**.

In an alternative exemplary embodiment of the invention, the check presentment module **116** can generate an ICL print stream without first generating an ICL or a substitute check file. The check presentment module **116** can collect data directly from the image file database **113**, the financial data file database **114**, and/or the addenda data file database **112** for creation of the print stream. The check presentment module **116** can store the collected data in pre-defined fields of a print stream file and transmit the print stream file to the printer **117** or the RI printer **127** for printing.

The functionality of the check presentment module **116** is described in more detail below with reference to FIG. **8**.

A person of skill in the art will recognize that the image file database **113**, the financial data file database **114**, the addenda data file database **115**, and the substitute check database **108** can be part of the same physical unit, a single database, or separate components.

In an alternative exemplary embodiment, the depositing institution **103** can forward original or substitute paper checks to the capture site **104** associated with the check processing site **105**. Although only one capture site **104** is illustrated in FIG. **1**, multiple capture sites can be associated with the check processing site **105**. The capture site **104** can perform the check image and financial data capture process and can forward the captured images and data to the check processing site **105**.

The capture site **104** receives paper checks from the depositing institution **103** and processes each paper check via a sorter **307**. The sorter **307** comprises an image capture device (not shown), such as a scanner or camera, which captures at least one electronic image of each check. For example, the sorter **307** can capture, for each check, an image of the front of the check and an image of the back of the check. Upon image capture, the sorter **307** forwards each image to a CS data capture module **311** of a CS check processor **309** for further processing. The CS data capture module **311** stores the electronic image(s) in one or more image files, which the CS data capture module **311** maintains in a database **310** of the CS check processor **309**.

The sorter **307** further comprises a MICR reader (not shown) that reads the MICR data from each check. Upon reading the MICR data, the sorter **307** identifies additional financial data related to the check, which is incidental to the processing of the check. For example, the sorter **307** can identify a unique item sequence number, a check processing site identifier, a processing date, a check amount, and/or a routing transit number of the depositing institution **103**. The sorter **307** forwards the financial data to the CS data capture module **311** for further processing. In one exemplary embodiment of the invention, the sorter **307** and the CS data capture module **311** can be part of the same physical unit.

The CS data capture module **311** stores a form financial data file with multiple fields. For example, the CS data capture module **311** can store the form financial data file with fields F**1**-F**7** and F**10**-F**12**. The CS data capture module **311** reads the financial data from the sorter **307** and parses and stores portions of the financial data in each of the data fields. For example, the CS data capture module **311** can store truncated financial data in fields F**1**-F**7** of the financial data file. The CS data capture module **311** can further store untruncated financial data in fields F**10**-F**11** of the financial data file. The fields of the financial data file can comprise all of the MICR data from the original paper check. The CS data capture module **311** stores the financial data file in the database **310**.

The CS check processor **309** further comprises a reject/repair module **313**, which can verify, for each check, the contents of the image file(s) and the financial data file. The reject/repair module **313** analyzes the financial data file for errors. For example, the reject/repair module **313** might detect an error if a field of the financial data file is empty or if it comprises a character or string that is not in the proper format. If an error is detected, the reject/repair module **313** presents the image file(s) and certain of the associated financial data from the financial data file on a display **319** for viewing by a user. In an exemplary embodiment, the display **319** can be a computer monitor or another device suitable for presenting images and textual data to the user.

The reject/repair module **313** presents the financial data from fields F**1**, F**5**, and F**6** of the financial data file on the display **319**. The reject/repair module **313** also presents the complete on us data from field F**10** in place of the truncated on us data in fields F**2**, F**3**, and F**4** on the display **319**. The reject/repair module **313** further presents the complete auxiliary on us data from field F**11** in place of the truncated auxiliary on us data in field F**7** on the display **319**. Thus, the display **319** presents a user with all of the MICR data from the original paper check.

The user compares the presented financial data with the presented image file(s) and corrects any errors in the financial data via a keyboard **320** or other suitable input device known in the art. For example, where a displayed data field is empty or incorrect but the displayed image of the check comprises data corresponding to the data field, the user can enter the financial data from the displayed image into the displayed data field.

Then, the reject/repair module **313** stores the complete, corrected auxiliary on us data displayed in field F**7** in field F**11** of the financial data file. The reject/repair module **313** further stores the complete, corrected on us data displayed in fields F**2**, F**3**, and F**4** in field F**10** of the financial data file. In one embodiment of the invention, the reject/repair module **313** can truncate the data in each corrected field, in accordance with the requirements of each of fields F**2**, F**3**, F**4**, and F**7**. Then, the reject/repair module **313** stores the corrected, truncated data in corresponding fields of the financial data file.

The functionality of the reject/repair module **313** is described in more detail below with reference to FIGS. **6**A and **6**B.

For each check, the CS data capture module **311** can forward the electronic image(s) of the check and the check's financial data to the data capture module **111** of the check processing site **105** for further processing, as discussed above with reference to FIG. **1**. In this case, the forwarded data can be stored in the appropriate database(s) and can be accessed via the check presentment module **116** to prepare the requested form of presentment to the receiving institution **125**. At the check processing site **105**, the data capture module **111** processes the financial data and images for presentment to the receiving institution **125**.

In another alternative exemplary embodiment, the depositing institution **103** can create an ICL based on the paper checks and can communicate the ICL to the check processing site **105**. In this case, the depositing institution **103** can comprise components similar to those of the check processing site **105**.

The depositing institution **103** processes paper checks at a sorter **207**. The sorter **207** electronically captures information from each paper check. The sorter **207** comprises an image capture device (not shown), such as a scanner or camera, which captures at least one electronic image of each check. For example, the sorter **207** can capture, for each check, an image of the front of the check and an image of the back of the check. Upon image capture, the sorter **207** forwards each image to a DI data capture module **211** of a DI check processor **209** for further processing. The DI data capture module **211** can store the electronic image(s) in one or more image files, which the depositing institution data capture module **211** maintains in a database **210** of the DI check processor **209**. In one exemplary embodiment of the invention, the sorter **207** and the DI data capture module **211** can be part of the same physical unit.

The sorter **207** further comprises a MICR reader (not shown) that reads the MICR data from each check. Upon reading the MICR data, the sorter **207** identifies additional financial data related to the check, which is incidental to the processing of the check. For example, the sorter **207** can identify a unique item sequence number, a check processing site identifier, a processing date, a check amount, and/or a routing transit number of the depositing institution **103**. The

sorter **207** forwards the financial data to the DI data capture module **211** for further processing.

The DI data capture module **211** stores a form financial data file with multiple fields. For example, the DI data capture module **211** can store the form financial data file with fields F**1**-F**7** and F**10**-F**12**. The DI data capture module **211** reads the financial data from the sorter **207** and parses and stores portions of the financial data in each of the data fields. For example, the DI data capture module **211** can store truncated financial data in fields F**1**-F**7** of the financial data file. The DI data capture module **211** can further store untruncated financial data in fields F**10**-F**11** of the financial data file. The fields of the financial data file can comprise all of the MICR data from the original paper check. The DI data capture module **211** stores the financial data file in the database **210**.

The DI check processor **209** further comprises an addenda data module **212**, which generates and/or captures electronic addenda data for each check. For example, the addenda data can comprise a bank endorsement. The addenda data module **212** inputs the addenda data into one or more addenda data files. The addenda data module **212** stores the addenda data file(s) in the database **210**.

For each check, the DI data capture module **211** associates the corresponding image file(s), financial data file, and addenda data file(s) for a check with a sequence number, identification number, or other suitable data link known in the art.

The DI check processor **209** further comprises a reject/repair module **213**, which can verify, for each check, the contents of the image file(s) and the financial data file. The reject/repair module **213** analyzes the financial data file for errors. For example, the reject/repair module **213** might detect an error if a field of the financial data file is empty or if it comprises a character or string that is not in the proper format. If an error is detected, the reject/repair module **213** presents the image file(s) and certain of the associated financial data from the financial data file on a display **219** for viewing by a user. In an exemplary embodiment, the display **219** can be a computer monitor or another device suitable for presenting images and textual data to the user.

The reject/repair module **213** presents the financial data from fields F**1**, F**5**, and F**6** of the financial data file on the display **219**. The reject/repair module **213** also presents the complete on us data from field F**10** in place of the truncated on us data in fields F**2**, F**3**, and F**4** on the display **219**. The reject/repair module **213** further presents the complete auxiliary on us data from field F**11** in place of the truncated auxiliary on us data in field F**7** on the display **219**. Thus, the display **219** presents the user with the complete MICR data from the original paper check.

The user compares the presented financial data with the presented image file(s) and corrects any errors in the financial data via a keyboard **220** or other suitable input device known in the art. For example, where a displayed data field is empty or incorrect but the displayed image of the check comprises data corresponding to the data field, the user can enter the financial data from the displayed image into the displayed data field.

Then, the reject/repair module **213** stores the complete, corrected auxiliary on us data displayed in field F**7** in field F**11** of the financial data file. The reject/repair module **213** further stores the complete, corrected on us data displayed in fields F**2**, F**3**, and F**4** in field F**10** of the financial data file. In one embodiment of the invention, the reject/repair module **213** truncates the data in each corrected field, in accordance with the requirements of each of fields F**2**, F**3**, F**4**, and F**7**. Then, the reject/repair module **213** stores the corrected, truncated data in the corresponding fields of the financial data file.

The functionality of the reject/repair module **213** is described in more detail below with reference to FIGS. **6**A and **6**B.

The DI check processor **209** further comprises an ICL module **215**, which generates at least one ICL comprising information regarding one or more bundles of checks. Each bundle can comprise one or more checks. For each check, the ICL can include the electronic image(s) from the check's image file(s), the financial data from the check's financial data file, and the addenda data from the check's addenda data file.

The ICL can further comprise a series of records related to the checks. For example, for each bundle of checks in the ICL, the ICL can include a bundle summary control record comprising information about the bundle, such as a bundle identification number, the number of items in the bundle, the value of each of the checks in the bundle, and the total value of all the checks in the bundle. The ICL also can comprise a cover page control record comprising information about the origin and destination of the ICL, and a cash letter bundle summary control record comprising a summary of all bundle summary control records in the ICL. The DI check processor **209** can forward the ICL to the data capture module **111** of the check processing site **105** for further processing.

Those skilled in the art will appreciate that exemplary system **100** is merely representative of the components for processing checks. Other embodiments of the invention may not have all of the components identified in FIGS. **1**-**3** or can include additional components.

FIG. **4** is a flow chart depicting a method **400** for processing checks, according to an exemplary embodiment of the invention. The exemplary method **400** is illustrative and, in alternative embodiments of the invention, certain steps can be performed in a different order, in parallel with one another, or omitted entirely, and/or certain additional steps can be performed without departing from the scope and spirit of the invention. The method **400** is described below with reference to FIGS. **1** and **4**.

In step **402**, the check processing site **105** receives a conventional paper cash letter comprising original and/or substitute paper checks from the depositing institution **103**. At the check processing site **105**, the paper checks are initially processed via the sorter **107**. In step **405**, the sorter **107** selects a check for processing. In step **410**, the sorter **107** captures at least one electronic image of the check. In an exemplary embodiment, the sorter **107** captures an image of the front of the check and an image of the back of the check. In step **415**, the sorter **107** communicates the captured electronic image(s) to the data capture module **111**, which creates at least one image file comprising the electronic image(s). In step **420**, the data capture module **111** stores the image file(s) in the image file database **113**.

In step **425**, the data capture module **111**, in conjunction with the sorter **107** and the image quality analysis module **110**, creates a financial data file comprising information regarding the check. For example, the financial data file can comprise the check's financial data and the results of an image quality analysis performed on the captured electronic image(s) of the check. Step **425** is described in more detail below with reference to FIG. **5**. In step **430**, the data capture module **111** stores the financial data file in the financial data file database **114**.

In step **435**, the addenda data module **112** creates an addenda data file comprising addenda data for the check. The addenda data module **112** can generate and/or capture the

addenda data from the check. In an exemplary embodiment, the addenda data can comprise a bank endorsement, a check processing date, a processing sequence number, and/or an image quality record. In step **440**, the addenda data module **112** stores the addenda data file in the addenda data file database **115**.

In step **445**, the data capture module **111** associates the check's image file(s), financial data file, and addenda data file(s) with each other. For example, the data capture module **111** can associate the image file(s), the financial data file, and the addenda data file(s) via a common sequence number, identification number, file name, or other suitable data link known in the art.

In step **450**, the reject/repair module **118** conducts a reject/repair analysis of the check's financial data file. The reject/repair module **118** allows detection and correction of certain errors in the financial data file. Step **450** is discussed in more detail below with reference to FIGS. **6**A and **6**B.

In step **455**, the sorter **107** determines whether to select another check for image/financial data capture. If so, the method **400** branches back to step **405** to repeat the image/financial data capture of another check. If the sorter **107** will not select another check, then the method **400** branches to step **460** to present the selected check(s) for payment. Step **460** is described in more detail below with reference to FIG. **7**.

FIG. **5**A and FIG. **5**B are flow charts depicting a method **425** for creating a financial data file comprising expanded mass data sets, according to an exemplary embodiment of the invention, as referred to in step **425** of FIG. **4**. The exemplary method **425** is merely illustrative and, in alternative embodiments of the invention, certain steps can be performed in a different order, performed in parallel with one another, or omitted entirely, and/or certain additional steps can be performed without departing from the scope and spirit of the invention. The method **425** is described below with reference to FIGS. **1** and **5**.

In step **503**, a form financial data file is created with fields F**1**-F**7** and F**10**-F**12**, and the form financial data file is stored by the data capture module **111**. The data capture module **111** can configure fields F**1**-F**7** of the form financial data file to receive truncated financial data. For example, the data capture module **111** can designate that Field F**2** cannot include any dashes or other extraneous characters. The data capture module **111** can further designate that Field F**2** can receive only up to three bytes of data or a specified number of characters.

The fields F**1**-F**7** correspond to the standard fields established by the American National Standards Institute Specifications for Electronic Exchange of Check and Image Data (ANSI X9.37/X9.100), which establish the specific type, format, and amount of data for each of those fields. Note that, in certain exemplary embodiments of the invention, the fields F**1**-F**7** can correspond to other appropriate industry standards, as may change from time to time. For example, the data stored in the financial data file can comprise amount data stored in field F**1**, process control data stored in field F**2**, account number data stored in field F**3**, check number data stored in field F**4**, routing transit number data stored in field F**5**, an external processing code stored in field F**6**, and auxiliary on us data stored in field F**7**.

In step **505**, the sorter **107** identifies financial data related to the paper check. For example, the sorter **107** can read MICR data from the check and can identify other financial data that is incidental to the processing of the check. The MICR data can comprise a check amount, process control data, account number data, check number data, a payor bank's routing transit number, and auxiliary on us data. Additionally, the sorter **107** can identify a unique item sequence number, a check processing site identifier, a processing date, and/or a routing transit number of the depositing institution **103**.

In step **507**, the sorter **107** transmits the identified financial data to the data capture module **111**. In step **510**, the data capture module **111** parses amount data from the financial data. The term "amount data" is used herein to refer to financial data that relates to the value of the check. For example, the amount data can comprise the U.S. dollar value of the check, which can be expressed in cents. In step **513**, the data capture module **111** stores the amount data in field F**1** of the financial data file created in step **503**.

In step **515**, the data capture module **111** parses process control data from the financial data. The term "process control data" is used herein to refer to a check number or transaction code that a bank uses to identify an item or a group of items. In step **516**, the data capture module **111** stores the process control data in field F**10** of the financial data file.

In step **517**, the data capture module **111** truncates the process control data to remove extraneous characters such as dashes and to remove excess characters, as required by field F**2**. For example, if field F**2** only can receive up to three bytes of data and the process control data is ten bytes long, the data capture module **111** can truncate seven bytes of data from the process control data. In step **518**, the data capture module **111** stores the truncated process control data in field F**2** of the financial data file.

In step **520**, the data capture module **111** parses account number data from the financial data. The term "account number data" is used herein to refer to information related to the check payor's account at the receiving institution. In step **521**, the data capture module **111** stores the account number data in field F**10** of the financial data file, next to the process control data stored in field F**10** in step **516**. In exemplary embodiments, the account number data and the process control data in field F**10** can be separated by a dash, colon, or other suitable separator.

In step **522**, the data capture module **111** truncates the account number data to remove extraneous characters such as dashes and to remove excessive characters, as required by field F**3**. For example, if field F**3** only can receive up to eight bytes of data and the account number data is ten bytes long, the data capture module **111** can truncate two bytes of data from the account number data. In step **523**, the data capture module **111** stores the truncated account number data in field F**3** of the financial data file.

In step **525**, the data capture module **111** parses check number data from the financial data. The term "check number data" is used herein to refer to information that can be used to identify the check, including, e.g., a number or a sequence of letters, characters, and/or numbers. In step **526**, the data capture module **111** stores the check number data in field F**10** of the financial data file, next to the account number data stored in field F**10** in step **521**. For example, the check number data and the account number data in field F**10** can be separated by a dash, colon, or other suitable separator.

In step **527**, the data capture module **111** truncates the check number data to remove extraneous characters such as dashes and to remove excessive characters, as required by field F**4**. For example, if field F**4** only can receive up to two bytes of data and the check number data is nine bytes long, the data capture module **111** can truncate seven bytes of data from the check number data. In step **528**, the data capture module **111** stores the truncated check number data in field F**4** of the financial data file.

In step **530**, the data capture module **111** parses routing transit number data from the financial data. The term "routing

transit number data" is used herein to refer to information that can be used to identify the bank by or through which the check is payable, including, e.g., a number or a sequence of letters, characters, and/or numbers. In step **533**, the data capture module **111** stores the routing transit number data in field F**5** of the financial data file.

In step **535**, the data capture module **111** determines an external processing code for the check. The term "external processing code" is used herein to refer to information that can be used to uniquely identify a group of items. For example the external processing code can identify certain items as return items, certain items as substitute checks, and certain items as substitute checks for return items. In step **537**, the data capture module **111** stores the external processing code in field F**6** of the financial data file.

In step **540**, the data capture module **111** parses auxiliary on us data from the financial data. The term "auxiliary on us data" is used herein to refer to information that can be used to uniquely identify a check. For example, the auxiliary on us data can comprise a serial number or other unique set of numbers, letters, and/or characters. In step **543**, the data capture module **111** stores the auxiliary on us data in field F**11** of the financial data file.

In step **545**, the data capture module **111** truncates the auxiliary on us data to remove extraneous characters such as dashes and to remove excess characters, as required by field F**7**. For example, if field F**7** can only receive up to six bytes of data and the auxiliary on us data is nine bytes long, the data capture module **111** can truncate three bytes of data from the auxiliary on us data. In step **550**, the data capture module **111** stores the truncated auxiliary on us data in field F**7** of the financial data file.

In step **553**, the data capture module **111** reads at least one result of an image quality analysis performed on the electronic image(s) of the check. In step **555**, the data capture module **111** stores the image quality analysis result(s) in field F**12** of the financial data file. The method **425** then branches to step **430** (FIG. **4**).

FIG. **6**A and FIG. **6**B are flow charts depicting a method **450** for conducting a reject/repair analysis of a financial data file using expanded mass data sets of the financial data file, according to an exemplary embodiment of the invention, as referred to in step **450** of FIG. **4**. The exemplary method **450** is merely illustrative and, in alternative embodiments of the invention, certain steps can be performed in a different order, performed in parallel with one another, or omitted entirely, and/or certain additional steps can be performed without departing from the scope and spirit of the invention. The method **450** is described below with reference to FIGS. **1** and **6**.

In step **605**, the reject/repair module **118** analyzes the financial data file for errors. For example, the reject/repair module **118** can detect an error if a field of the financial data file is empty, comprises data in an incorrect format, or comprises the wrong data. In step **607**, the reject/repair module **118** determines whether it detected an error. If not, the method **450** branches to step **455** (FIG. **4**). If the reject/repair module **118** detects an error, the method **450** branches to step **610**.

In step **610**, the reject/repair module **118** identifies the image file(s) corresponding to the financial data file. For example, the reject/repair module **118** can identify the image file(s) with the same file name, sequence number, or identification number as the financial data file. In step **615**, the reject/repair module **118** presents the image(s) identified in step **610** on the display **119** for viewing by a user. In step **620**, the reject/repair module **118** reads the data in fields F**1** (amount data), F**5** (routing transit number data), and F**6** (external process code) of the financial data file. In step **625**, the reject/repair module **118** presents the data from fields F**1**, F**5**, and F**6** of the financial data file on the display **119** for viewing by the user.

In steps **630-665**, the reject/repair module **118** presents the untruncated financial data, i.e., the financial data in fields F**10** and F**11** of the financial data file, in fields F**2**, F**3**, F**4**, and F**7** on the display **119**.

In step **630**, the reject/repair module **118** reads and parses the process control data from field F**10** of the financial data file. In step **635**, the reject/repair module **118** presents the parsed process control data from field F**10** in field F**2** on the display **119**. Thus, the untruncated process control data from field F**10** is displayed in field F**2**.

In step **640**, the reject/repair module **118** reads and parses the account number data from field F**10** of the financial data file. In step **645**, the reject/repair module **118** presents the parsed account number data from field F**10** in field F**3** on the display **119**. Thus, the untruncated account number data from field F**10** is displayed in field F**3**.

In step **650**, the reject/repair module **118** reads and parses the check number data from field F**10** of the financial data file. In step **655**, the reject/repair module **118** presents the parsed check number data from field F**10** in field F**4** on the display **119**. Thus, the untruncated check number data from field F**10** is displayed in field F**4**.

In step **660**, the reject/repair module **118** reads the auxiliary on us data from field F**11** of the financial data file. In step **665**, the reject/repair module **118** presents the auxiliary on us data from field F**11** in field F**7** on the display **119**. Thus, the untruncated auxiliary on us data from field F**11** is displayed in field F**7**.

By presenting the untruncated financial data in the display **119**, the reject/repair module **118** allows a user to evaluate and correct errors in the financial data file using the complete MICR data from the original paper check. The reject/repair module **118** also allows a user to correct errors in both the truncated and untruncated data in the financial data file. In step **670**, the user compares the displayed financial data with the displayed electronic check image(s) to determine how to correct the financial data file error. The user can correct the data in the display **119** by inputting the correct data into the reject/repair module via a keyboard **120** or another input device. For example, where a displayed data field is empty but the displayed image of the check comprises data corresponding to the data field, the user can enter the financial data from the displayed image into the displayed data field.

In steps **675-695**, the reject/repair module **118** stores the corrected data in the financial data file. In step **675**, the reject/repair module **118** determines whether the corrected data is in field F**2** in the display **119**. If so, the method **450** branches to step **676**. In step **676**, the reject/repair module **118** stores the corrected process control data in place of the process control data in field F**10** of the financial data file. In step **677**, the reject/repair module **118** truncates the corrected process control data, as described above in conjunction with FIG. **5**, step **517**. In step **678**, the reject/repair module **118** stores the truncated, corrected process control data in field F**2** in the financial data file, and the method **450** continues to step **455** (FIG. **4**).

If the reject/repair module **118** determines in step **675** that the corrected data is not in field F**2**, then the method **450** branches to step **680**. In step **680**, the reject/repair module **118** determines whether the corrected data is in field F**3** in the display **119**. If so, the method **450** branches to step **681**. In step **681**, the reject/repair module **118** stores the corrected account number data in place of the account number data in

field F10 of the financial data file. In step **682**, the reject/repair module **118** truncates the account number data, as described above in conjunction with FIG. **5**, step **522**. In step **683**, the reject/repair module **118** stores the truncated, corrected account number data in field F3 in the financial data file, and the method **450** continues to step **455** (FIG. **4**).

If the reject/repair module **118** determines in step **680** that the corrected data is not in field F3, then the method **450** branches to step **685**. In step **685**, the reject/repair module **118** determines whether the corrected data is in field F4 in the display **119**. If so, the method **450** branches to step **686**. In step **686**, the reject/repair module **118** stores the corrected check number data in place of the check number data in field F10 of the financial data file. In step **687**, the reject/repair module **118** truncates the check number data, as described above in conjunction with FIG. **5**, step **527**. In step **688**, the reject/repair module **118** stores the truncated, corrected check number data in field F4 in the financial data file, and the method **450** continues to step **455** (FIG. **4**).

If the reject/repair module **118** determines in step **685** that the corrected data is not in field F4, then the method **450** branches to step **690**. In step **690**, the reject/repair module **118** determines whether the corrected data is in field F7 in the display **119**. If so, the method **450** branches to step **691**. In step **691**, the reject/repair module **118** stores the corrected auxiliary on us data in place of the auxiliary on us data in field F11 of the financial data file. In step **692**, the reject/repair module **118** truncates the auxiliary on us data, as described above in conjunction with FIG. **5**, step **545**. In step **693**, the reject/repair module **118** stores the truncated, corrected auxiliary on us data in field F7 in the financial data file, and the method **450** continues to step **455** (FIG. **4**).

If the reject/repair module **118** determines in step **690** that the corrected data is not in field F7, then the method **450** branches to step **695**. In step **695**, the reject/repair module **118** stores the corrected data in the corresponding field in the financial data file. For example, if the corrected data is in displayed field F1, F5, or F6, the reject/repair module **118** can store the corrected data in field F1, F5, or F6, respectively, of the financial data file. The method **450** continues to step **455** (FIG. **4**).

FIG. **7** is a flow chart depicting a method **460** for presenting a check for payment, according to an exemplary embodiment of the invention, as referred to in step **460** of FIG. **4**. The exemplary method **460** is merely illustrative and, in alternative embodiments of the invention, certain steps can be performed in a different order, performed in parallel with one another, or omitted entirely, and/or certain additional steps can be performed without departing from the scope and spirit of the invention. The method **460** is described below with reference to FIGS. **1** and **7**.

In step **705**, the check presentment module **116** selects a check for presentment to the receiving institution **125**. In step **710**, the check presentment module **116** generates a substitute check form file with fields for the check's financial data, addenda data, and electronic image(s). By entering the financial data, addenda data, and electronic image(s) into the appropriate fields, the check presentment module **116** can create a substitute check file that can be used to present a substitute check and/or an ICL to the receiving institution **125**.

In step **715**, the check presentment module **116** reads the check's financial data from the financial data file. In step **720**, the check presentment module **116** identifies the image file(s) corresponding to the financial data file. For example, the check presentment module **116** can identify the image file(s) with the same file name, sequence number, or identification number as the financial data file. In step **725**, the check presentment module **116** identifies the addenda data file(s) corresponding to the financial data file. For example, the check presentment module **116** can identify the addenda data file(s) with the same file name, sequence number, or identification number as the financial data file.

In step **730**, the check presentment module **116** stores the financial data from the financial data file, the addenda data from the identified addenda data file(s), and the electronic image(s) from the identified image file(s) in the appropriate fields of the substitute check file. In this regard, the complete, untruncated data from fields F10 and F11 of the financial data file is stored in the substitute check file, thereby including the information necessary for a substitute check to comply with the requirements of the Act. In step **733**, the check presentment module **116** stores the substitute check file in the substitute check database **108**.

In step **735**, the check presentment module **118** determines whether to select another check for presentment to the receiving institution **125**. For example, steps **705-733** can be repeated for each check associated with a particular receiving institution **125**, whereby the associated checks can be presented to the receiving institution **125** at the same time. If another check is to be selected for presentment, the method **460** branches back to step **705** to repeat steps **705-733** for another check. If not, the method **460** branches to step **740**.

In step **740**, the check presentment module **116** creates an electronic ICL file comprising the substitute check file for each selected check. The ICL file can further comprise a series of addenda and records related to the selected check(s). For example, the ICL file can comprise an addendum comprising information about a bank of first deposit. In addition, for each bundle of substitute checks in the ICL, the ICL can include a bundle summary control record comprising information about the bundle. For example, the bundle summary control record can comprise a bundle identification number, the number of items (substitute check files) in the bundle, the value of each of the items in the bundle, and the total value of all the items in the bundle. The ICL file also can comprise a cover page control record comprising information about the origin and destination of the ICL file, and a cash letter bundle summary control record comprising a summary of all bundle summary control records in the ICL file.

To create the ICL file in an exemplary embodiment, the check presentment module **116** can organize the substitute check files (or items) into at least one bundle. Each bundle can comprise information regarding one or more substitute checks. The check presentment module **116** can read information regarding the substitute checks from the financial data files, addenda data files, image files, and/or substitute check files corresponding to the substitute checks. Then, the check presentment module **116** can store certain of the read information into appropriate record fields of the ICL file.

The check presentment module **116** also can generate and enter into appropriate fields of the ICL file information regarding the bundle(s). For example, for each bundle, the check presentment module **116** can add up the total number of items in the bundle and the total value of all items in the bundle and can store the total number of items, the total value of all items, and the value of each item in the bundle summary control record corresponding to the bundle. Similarly, the check presentment module **116** can add up the total value of all the items in all of the substitute check bundles (or the total value of all bundles) and can store the total value amount in the cash letter bundle summary control record of the ICL file.

In step **745**, the check presentment module **116** determines whether to present the ICL electronically or via paper. If the

ICL is to be presented electronically, the method **460** branches to step **775**. In step **775**, the check presentment module **116** electronically transmits the ICL file to an RI computer **126** of the receiving institution **125**, e.g., via a network (not shown).

If the check presentment module **116** determines in step **745** to present the ICL via paper, the method **460** branches to step **747**. In step **747**, the check presentment module **116** generates a print stream by which the ICL can be printed onto paper. Step **747** is described in more detail below with reference to FIG. **8**.

In step **750**, the check presentment module **116** determines whether to print the ICL locally or remotely. If the ICL is to be printed locally, the method **460** branches to step **755**. In step **755**, the check presentment module **116** prints the ICL via a printer **117**. The check presentment module **116** prints the ICL using the print stream generated in step **747**. More specifically, the check presentment module **116** forwards the print stream to the printer **117** for printing. The printer **117** reads the data specified in print stream, generates the records for printing based on the read data, and prints the generated records in order to create the printed ICL. In step **760**, an operator of the check processing site **105** collects the printed ICL, including the paper substitute check(s), for delivery to the receiving institution **125**. For example, the operator can mail or courier the printed ICL to the receiving institution **125**.

If the check presentment module **116** determines in step **750** to print the ICL remotely, the method **460** branches to step **770**. In step **770**, the check presentment module **116** transmits the print stream generated in step **747** to the receiving institution **125**, e.g., via a network (not shown). In step **773**, the receiving institution **125** prints the ICL, including the paper substitute check(s), on the RI printer **127**. More specifically, the RI printer **127** reads the data specified in the print stream, generates the records for printing based on the read data, and prints the generated records in order to create the printed ICL.

In an alternative exemplary embodiment of the invention, the check presentment module **116** can generate an ICL print stream (as in step **747** described below with reference to FIG. **8**) without first generating an ICL file or a substitute check file. The check presentment module **116** can collect data directly from the image file database **113**, the financial data file database **114**, and/or the addenda data file database **112** for creation of the print stream. The check presentment module **116** can store the collected data in pre-defined fields of a print stream file and transmit the print stream file to the printer **117** or the RI printer **127** for printing.

FIG. **8** is a flow chart depicting a method **747** for generating a cash letter print stream according to an exemplary embodiment of the invention, as referred to in step **747** of FIG. **7**. The exemplary method **747** is merely illustrative and, in alternative embodiments of the invention, certain steps can be performed in a different order, performed in parallel with one another, or omitted entirely, and/or certain additional steps can be performed without departing from the scope and spirit of the invention. The method **747** is described below with reference to FIGS. **1** and **8**.

In step **805**, a form print stream file is created and stored. The form print stream file comprises electronic form definitions for each cash letter document to be printed in the cash letter. The cash letter documents include a cover page, a bundle summary, substitute checks, a cash letter bundle summary, and an exception report page. The form definitions determine how and where to include information in the print stream for each cash letter document. For example, the form print stream file can comprise a form definition for the print stream for each of the cover page, the bundle summary, the substitute checks, the cash letter bundle summary, and the exception report page. Each form definition defines data fields and their page locations, which each correspond to the information and format required for a paper cash letter. Based on the form definitions, the check presentment module **116** can retrieve and input the proper information (data and/or images) into the data fields to create the print stream. The check presentment module **116** stores the form print stream file in a form database **130**.

In step **807**, the check presentment module **116** determines the file format in which to generate the print stream. The print stream file format can vary depending on the person or entity printing the cash letter. For example, the file format can vary depending on the printing person/entity's file format capabilities. A cover page control record of the ICL file generated in step **740** (FIG. **7**) can comprise information regarding the printing person or entity and/or the person/entity's file format capabilities. For example, if the cover page control record indicates that the cash letter will be printed by a Federal Reserve Bank, the print stream can be in a .AFP file format. Alternative suitable file formats, including the .PDF file format, will be apparent to a person of skill in the art.

In steps **810-830**, the check presentment module **116** creates the cash letter print stream in the appropriate file format.

In step **810**, the check presentment module **116** adds a cover page to the print stream. The cover page comprises information about the cash letter's contents, such as the number of substitute checks in the cash letter, information identifying the transmitting bank, and/or information identifying the receiving institution **125**. For example, the cover page information can comprise information identifying the bank receiving the cash letter by American Bankers Association ("ABA") number, name, and address. It can further comprise print dispatch information, such as the bin, section, and/or courier assigned to the cash letter. To add the cover page to the print stream, the check presentment module **116** inserts information contained within the ICL file into fields of one or more of the form definitions created in step **805**. For example, the check presentment module **116** can insert information contained within the ICL's cover page control record into corresponding fields of a cover page form definition.

In step **813**, the check presentment module **116** selects a bundle comprising at least one substitute check for inclusion in the print stream. In step **815**, the check presentment module **116** adds a bundle summary to the print stream. The bundle summary comprises information regarding the bundle selected in step **813**. For example, the bundle summary can comprise the number of substitute checks in the bundle, the value of each of the substitute checks in the bundle, and the total value of all substitute checks in the bundle. To add the bundle summary to the print stream, the check presentment module **116** inserts information contained within the ICL file into fields of one or more of the form definitions created in step **805**. For example, the check presentment module **116** can insert information contained within the ICL's bundle summary control record into corresponding fields of a bundle summary form definition.

In step **820**, the check presentment module **116** adds the bundle's substitute check(s) to the print stream. To add the substitute check(s) to the print stream, the check presentment module **116** inserts information contained within the ICL file into fields of one or more of the form definitions created in step **805**. For example, for each substitute check, the check presentment module **116** can insert the financial data, addenda data, and/or the electronic image(s) corresponding

to the substitute check (and/or stored in the substitute check file) into corresponding fields of a substitute check form definition. Upon printing the generated print stream, each substitute check will include all of the original MICR data of the corresponding original paper check and all endorsements. For example, each substitute check can comply with the American National Standards Institute Specifications for an Image Replacement Document (ANSI X9.100-140, X9.90), or other appropriate industry standards, as may change from time to time.

In step **825**, the check presentment module **116** determines whether to select another bundle for inclusion in the print stream. For example, steps **813-820** can be repeated for each bundle to be included in the cash letter print stream. If the check presentment module **116** determines to select another bundle, the method **747** branches back to step **813** to repeat steps **813-820** for another bundle. If the check presentment module **116** determines in step **825** not to select another bundle, the method **747** branches to step **830** to complete creation of the print stream.

In step **830**, the check presentment module **116** adds a cash letter bundle summary to the print stream. The cash letter bundle summary comprises information about all of the bundles in the cash letter. For example, the cash letter bundle summary can comprise a total of the value of all the bundles in the cash letter. To add the cash letter bundle summary to the print stream, the check presentment module **116** inserts information contained within the ICL file into fields of one or more of the form definitions created in step **805**. For example, the check presentment module **116** can insert information from the cash letter bundle summary control record into corresponding fields of a cash letter bundle summary form definition.

In step **835**, the check presentment module **116** adds an exception report page to the print stream. The exception report page comprises information regarding any errors the check presentment module **116** incurred when adding other documents to the print stream file. For example, the exception report information can identify a substitute check for which the check presentment module **116** was unable to input corresponding substitute check information into the substitute check form definition. To add the exception report page to the print stream, the check presentment module **116** inserts information contained within the ICL file into fields of one or more of the form definitions created in step **805**. For example, the check presentment module **116** can insert information regarding or identifying the errors into corresponding fields of an exception report page form definition.

The method **747** continues to step **750** (FIG. **7**).

As set forth above, in alternative exemplary embodiments of the invention, the depositing institution **103** can generate an ICL for received checks or forward received paper checks to the capture site **104**. In such embodiments, the depositing institution **103** or the capture site **104** can perform certain of the method steps described above with reference to FIGS. **4-7**. For example, if the depositing institution **103** generates an ICL for received checks, the depositing institution **103** can capture, generate, and store electronic check images and financial data, as set forth in exemplary steps **405-445** of FIGS. **4**, **5**A, and **5**B. In addition, the reject/repair module **213** of the depositing institution **103** can perform reject/repair functions on the captured financial data, as set forth in the exemplary method **450** of FIGS. **4**, **6**A, and **6**B. The ICL Module **215** of the depositing institution **103** can generate an ICL comprising the captured electronic check images and financial data and can forward the generated ICL to the check processing site **105**, which can process the ICL in accordance with certain of the remaining exemplary steps of FIGS. **4**, **7**, and **8**.

FIG. **9** is a block diagram depicting a print stream **900** generated in accordance with an exemplary embodiment of the invention. First in the print stream **900** is the cover page **905**. The cover page **905** comprises information regarding the cash letter's contents, such as the number of substitute checks in the cash letter, information identifying the transmitting bank, and/or information identifying the receiving institution **125**. For example, the cover page can comprise information identifying the bank receiving the cash letter by ABA number, name, and address. It can further comprise print dispatch information, such as the bin, section, and/or courier assigned to the cash letter.

Second in the print stream is the bundle summary **910**A for the first bundle in the cash letter. The bundle summary **910**A comprises information regarding the contents of the first bundle. For example, the bundle summary **910**A can comprise the number of substitute checks in the bundle, the value of each of the substitute checks in the bundle, and the total value of all substitute checks in the bundle. For each bundle of substitute checks in the print stream, there is a corresponding bundle summary **910**A, **910**B, **910**X.

After each respective bundle summary **910**A, **910**B, **910**X in the print stream are the substitute checks **915**A, **915**B, **915**X listed in the corresponding bundle summary **910**A, **910**B, **910**X. Each substitute check can comprise all of the original MICR data of the corresponding original paper check and all endorsements.

Next in the print stream **900** is the cash letter bundle summary **920**. The cash letter bundle summary **920** comprises information about all of the bundles in the cash letter. For example, the cash letter bundle summary **920** can comprise a total of the value of all the bundles in the cash letter.

Last in the print stream **900** is the exception report page **925**, which comprises information regarding any errors the check presentment module **116** incurred when generating other documents in the print stream file. For example, the exception report page **925** can comprise information identifying a substitute check for which the check presentment module **116** was unable to input corresponding substitute check information into the substitute check form definition.

The information from the print stream **900** can be printed in order, with the resulting printout comprising a paper cash letter. For example, printing the information from the print stream **900** depicted in FIG. **9**, results in a properly formatted and ordered paper cash letter comprising substitute checks and audit data. The audit data (i.e., the cover page **905**, the bundle summary **910**A, **910**B, **910**X, the cash letter bundle summary **920**, and the exception report page **925**) comprises control reports that detail the documents printed concurrently therewith. Thus, the audit data provides a real-time inventory of the paper cash letter.

In an exemplary embodiment, the print stream **900** can be printed on perforated paper and passed through a bursting machine to create the paper cash letter. Upon printing, a paper burster can separate each printed page at its perforations, so that each separated page comprises a portion of the cash letter. Thus, the cover page **905**, bundle summaries **910**A, **910**B, **910**X, substitute checks **915**A, **915**B, **915**X, cash letter bundle summary **920**, and exception report page **925** can each be printed on a separate page based on the size of the pages between the perforations. Additionally, the different components of the paper cash letter can be printed on different color paper for easy identification.

In one embodiment of the invention, the check presentment module **116** can instruct the printer **117** (or the RI printer **127**) to print each of the documents on different types, colors, and/or sizes of paper. For example, the check presentment module **116** can instruct the printer **117** (or the RI printer **127**) to print the substitute checks **915**A, **915**B, **915**X on yellow paper and each of the other documents in the cash letter on blue paper. In yet another embodiment of the invention, the type, color, and/or size of the paper can vary depending on whether the transaction is a forward transaction or a return transaction. For example, the check presentment module **116** can instruct the printer **117** (or the RI printer **127**) to print each of the non-substitute check documents of a forward transaction on blue paper and each of the non-substitute check documents of a return transaction on red paper. In an exemplary embodiment, the print stream file form definition corresponding to each cash letter document can comprise a designation for a particular type, color, and/or size of paper on which to print the corresponding cash letter document.

FIG. **10** is a block diagram depicting a cover page **1000** printed from a print stream generated in accordance with an exemplary embodiment of the invention. The cover page **1000** is printed on one section of a perforated sheet of paper and comprises information regarding the cash letter's contents. The cover page **1000** can be separated from the other sections of the perforated sheet by tearing the sheet at its perforations. The exemplary cover page **1000** comprises a count **1005** of the number of items in the cash letter and destination information **1010** identifying the destination of the cash letter by ABA number, name, and address. It further comprises print dispatch information, such as the bin, section, and/or courier assigned to the cash letter. A person of skill in the art will recognize that the cover page **1000** can comprise other additional information related to the cash letter's contents, and/or certain illustrated information can be removed from the cover page **1000**, without departing from the scope and spirit of the invention.

FIG. **11** is a block diagram depicting a bundle summary page **1100** printed from a print stream generated in accordance with an exemplary embodiment of the invention. The bundle summary page **1100** is printed on three sections of a perforated sheet of paper. The sections of the bundle summary page **1100** can be separated from one another by tearing the sheet at its perforations. The exemplary bundle summary page **1100** comprises a count **1105** of the number of items in bundle A, the value of each of the items in the bundle, and the total value **1110** of all items in the bundle. It also includes information identifying the destination of the bundle summary page **1100** by bank name and address. A person of skill in the art will recognize that the bundle summary page **1100** can comprise other additional information related to the items in bundle A, and/or certain illustrated information can be removed from the bundle summary page **1100**, without departing from the scope and spirit of the invention.

FIG. **12** is a block diagram depicting a substitute check page **1200** printed from a print stream generated in accordance with an exemplary embodiment of the invention. The substitute check page **1200** comprises multiple substitute checks, printed front and back, on perforated paper. As shown in FIG. **12**, three substitute checks can be printed on a single piece of perforated paper, which can be separated at its perforations to produce individual pages for each substitute check.

FIG. **13** is a block diagram depicting a cash letter bundle summary page **1300** printed from a print stream generated in accordance with an exemplary embodiment of the invention. The cash letter bundle summary page **1300** is printed on three sections of a perforated sheet of paper. The sections of the cash letter bundle summary page **1300** can be separated from one another by tearing the sheet at its perforations. The exemplary cash letter bundle summary page **1300** comprises information regarding each bundle in the cash letter, including a bundle ID, bundle number, item count, and total value amount for each bundle in the cash letter. The cash letter bundle summary page **1300** comprises a total item count **1305** and a total value amount for all the bundles **1310**. In addition, the cash letter bundle summary page **1300** comprises information identifying the destination of the cash letter bundle summary page **1300** by bank ABA number, name, and address. A person of skill in the art will recognize that the cash letter bundle summary page **1300** can comprise other additional information related to the cash letter bundles, and/or certain illustrated information can be removed from the cash letter bundle summary page **1300**, without departing from the scope and spirit of the invention.

FIG. **14** is a block diagram depicting an exception report page **1400** printed from a print stream generated in accordance with an exemplary embodiment of the invention. The exception report page **1400** is printed on one section of a perforated sheet of paper. The exception report page **1400** can be separated from the other sections of the perforated sheet by tearing the sheet at its perforations. The exemplary exception report page **1400** comprises information regarding errors the check presentment module incurred when generating other documents in the print stream file. The errors relate to three documents, which are identified by routing transit number, sequence number, amount, and bundle ID. In addition, a reason for each error is provided. A person of skill in the art will recognize that the exception report page **1400** can comprise other additional information related to the errors, and/or certain illustrated information can be removed from the exception report page **1400**, without departing from the scope and spirit of the invention.

FIG. **15** is a flow chart depicting a method **1500** for verifying cash letter printing, according to an exemplary embodiment of the invention. The exemplary method **1500** is merely illustrative and, in alternative embodiments of the invention, certain steps can be performed in a different order, performed in parallel with one another, or omitted entirely, and/or certain additional steps can be performed without departing from the scope and spirit of the invention. The method **1500** is described below with reference to FIGS. **1** and **15**.

In step **1505**, the check presentment module **116** stores information regarding multiple ICLs to be printed in a print request record. The term "record" is used herein to refer to a set of electronic data, including, without limitation, a table, a file, and a part of a table or file. The information stored in the print request record includes data that uniquely identifies each ICL to be printed. For example, for each ICL, the print request record can include a total value of the items in the ICL, an ABA number of the bank that will receive the printed ICL, a total number of bundles in the ICL, and/or a total number of items in the ICL. In certain exemplary embodiments, the check presentment module **116** can store the print request record in a print database **135** of the check processor **109**.

In step **1510**, at least a portion of the ICLs are printed. Each printed ICL includes a machine-readable identifier, such as a barcode, with at least a portion of the information stored in the print request record. For example, one of the printers **117** and **127** can print the ICLs upon receiving an ICL print stream from the check presentment module **116**, substantially as described above in connection with FIGS. **7** and **8**. The print stream can include information necessary for printing the

machine-readable identifier, including at least a portion of the information stored in the print request record. In certain exemplary embodiments, a cover page of each printed ICL can include the printed machine-readable identifier.

In step **1515**, the check presentment module **116** reads the information in each of the printed machine-readable identifiers of the printed ICLs. In certain exemplary embodiments, the check presentment module **116** can receive the information from one or more barcode scanners (not shown) or other data readers at the print location (i.e., the check processing site **105** or the receiving institution **125**). For example, an operator at the print location can scan a printed barcode after the ICL containing the barcode is done printing.

In step **1520**, the check presentment module **116** stores the information read in step **1515** in a printed ICL record. In certain exemplary embodiments, the check presentment module **116** can store the printed ICL record in the print database **135**. In step **1525**, the check presentment module **116** compares the information in the print request record and the printed ICL record. Based on that comparison, in step **1530**, the check presentment module **116** identifies the ICLs, if any, that have not been printed (in step **1510**).

For example, if information identifying a particular ICL is present in the print request record but not in the printed ICL record, the check presentment module **116** can identify the ICL as not having been printed. Similarly, if information identifying a particular ICL is present in both the print request record and the printed ICL record, the check presentment module **116** can not identify the ICL.

In step **1535**, the check presentment module **116** outputs an alert including information regarding the ICLs identified in step **1530**. For example, the check presentment module **116** can output a visual and/or audible alert via one or more output devices at the check processing site **105** and/or the receiving institution **125**. In certain exemplary embodiments, an operator receiving the alert can investigate why the identified ICLs failed to print. For example, the operator can identify a printing error that caused the printing failure. The operator also can instruct the check presentment module **116** to attempt to re-print the ICL.

In certain exemplary embodiments, an operator can instruct the check presentment module **116** to perform one or more of the comparison, identification, and alert functions of steps **1525-1535** via the keyboard **120** or another input device associated with the check processor **109** and/or the receiving institution **125**. Alternatively, the check presentment module **116** can be configured to automatically perform these functions. For example, the check presentment module **116** can be configured to automatically perform these functions at specified time intervals.

Although the method **1500** has been described herein with regard to ICLs, a person of ordinary skill in the art having the benefit of the present disclosure will recognize that the method **1500** also can be applied to verify printing of items and/or item bundles. For example, the ICL printed in step **1510** can include a machine-readable identifier for each item and/or bundle. The machine-readable identifier can include information uniquely identifying the item and/or bundle. The check presentment module **116** can compare information in each printed machine-readable identifier with information in the print request record to determine whether each item and/or bundle has been printed.

FIG. **16** is a flow chart depicting a method **1600** for identifying duplicate printed paper cash letters, according to an exemplary embodiment of the invention. The exemplary method **1600** is merely illustrative and, in alternative embodiments of the invention, certain steps can be performed in a different order, performed in parallel with one another, or omitted entirely, and/or certain additional steps can be performed without departing from the scope and spirit of the invention. The method **1600** is described below with reference to FIGS. **1** and **16**.

In step **1605**, the check presentment module **116** generates a print stream for an ICL. The print stream includes information necessary for printing a machine-readable identifier, such as a barcode, with information uniquely identifying the ICL, such as a total value of the items in the ICL, an ABA number of the bank that will receive the printed ICL, a total number of bundles in the ICL, and/or a total number of items in the ICL. For example, the check presentment module **116** can generate the ICL print stream substantially as described above in connection with FIGS. **7** and **8**. In certain exemplary embodiments, the print stream can include an ICL cover page including the machine-readable identifier.

In step **1610**, the check presentment module **116** prints the ICL, including the machine-readable identifier. For example, the check presentment module **116** can transmit the print stream to one of the printers **117** and **127** for printing. In step **1615**, the check presentment module **116** reads the information in the printed machine-readable identifier of the printed ICL. In certain exemplary embodiments, the check presentment module **116** can receive the information from a barcode scanner (not shown) or other data reader at the print location (i.e., the check processing site **105** or the receiving institution **125**). For example, an operator at the print location can scan a printed barcode after the ICL containing the barcode is done printing.

In step **1620**, the check presentment module **116** compares the read information with information in a printed ICL record. As described above in connection with FIG. **15**, the printed ICL record includes information uniquely identifying ICLs that already have been printed. This information in the printed ICL record originated from data read from the machine-readable identifiers associated with each printed ICL upon completion of printing of the ICL. For example, for each printed ICL, the information can include a total value of the items in the ICL, an ABA number of the bank that will receive the printed ICL, a total number of bundles in the ICL, and/or a total number of items in the ICL.

Based on the comparison in step **1620**, in step **1625**, the check presentment module **116** determines whether the ICL was printed twice, i.e., whether the printed cash letter is a duplicate of an already printed ICL. For example, if the printed ICL record includes information identifying the ICL, then the check presentment module **116** can determine that the ICL was printed twice. Similarly, if the printed ICL record does not include information identifying the ICL, then the check presentment module **116** can determine that the ICL was not printed twice.

If the check presentment module **116** determines in step **1625** that the ICL was printed twice, the method **1600** branches to step **1630**. In step **1630**, the check presentment module **116** outputs an alert identifying the duplicate printed ICL. For example, the check presentment module **116** can output a visual and/or audible alert via one or more output devices at the check processing site **105** and/or the receiving institution **125**. In certain exemplary embodiments, an operator receiving the alert can discard the printed ICL.

If the check presentment module **116** determines in step **1625** that the ICL was not printed twice, then the method **1600** branches to step **1635**. In step **1635**, the check presentment module **116** stores the information read in step **1615** in the printed ICL record, so that the check presentment module **116** can identify any subsequently printed duplicates of the

printed ICL by comparing information in the duplicates with the information stored in the printed ICL record.

Although the method **1600** has been described herein with regard to ICLs, a person of ordinary skill in the art having the benefit of the present disclosure will recognize that the method **1600** also can be applied to identify duplicate printed items and/or duplicate printed item bundles. For example, the print stream generated in step **1605** can include a machine-readable identifier for each item and/or bundle. The machine-readable identifier can include information uniquely identifying the item and/or bundle. The check presentment module **116** can compare information in a printed machine-readable identifier with information in the printed ICL record to determine whether each item and/or bundle is a duplicate.

The invention can be used with computer hardware and software that performs the methods and processing functions described above. As will be appreciated by those skilled in the art, the systems, methods, and procedures described herein can be embodied in a programmable computer, computer executable software, or digital circuitry. The software can be stored on computer readable media. For example, computer readable media can include a floppy disk, RAM, ROM, hard disk, removable media, flash memory, memory stick, optical media, magneto-optical media, CD-ROM, etc. Digital circuitry can include integrated circuits, gate arrays, building block logic, field programmable gate arrays (FPGA), etc.

Although specific embodiments of the invention have been described above in detail, the description is merely for purposes of illustration. It should be appreciated, therefore, that many aspects of the invention were described above by way of example only and are not intended as required or essential elements of the invention unless explicitly stated otherwise. Various modifications of, and equivalent steps corresponding to, the disclosed aspects of the exemplary embodiments, in addition to those described above, can be made by those skilled in the art without departing from the spirit and scope of the invention defined in the following claims, the scope of which is to be accorded the broadest interpretation so as to encompass such modifications and equivalent structures.

We claim:

1. A computer-implemented method for identifying duplicate printed cash letters, comprising the steps of:

receiving by a check presentment module information obtained from a printed machine-readable identifier comprising information identifying a printed cash letter associated with the printed machine-readable identifier, the printed cash letter comprising at least one substitute check that is a legal equivalent of a corresponding paper check, the check presentment module implemented in a computer system that comprises instructions stored in a machine-readable medium and a processor that executes the instructions;

determining by the check presentment module whether the cash letter was printed twice by determining whether information stored in a record corresponds to the received information, wherein the information stored in the record identifies cash letters that were printed previously; and

outputting by the check presentment module an alert advising that the cash letter was printed twice in response to determining that the cash letter was printed twice.

2. The method of claim **1**, wherein the printed machine-readable identifier comprises a barcode.

3. The method of claim **1**, wherein the information in the printed machine-readable identifier comprises information uniquely identifying the cash letter.

4. The method of claim **3**, wherein the information uniquely identifying the cash letter comprises at least one of a total value of items in the cash letter, an ABA number of a bank that will receive a printed copy of the cash letter, a total number of item bundles in the cash letter, and a total number of items in the cash letter.

5. The method of claim **1**, wherein the step of determining whether the cash letter was printed twice comprises the step of determining whether the record comprises information uniquely identifying the cash letter.

6. The method of claim **1**, further comprising the step of the check presentment module storing the received information in the record in response to determining that the cash letter was not printed twice.

7. The method of claim **1**, wherein the alert uniquely identifies the cash letter.

8. The method of claim **1**, further comprising the steps of:

generating via the check presentment module a print stream for the cash letter, the print stream comprising information to be included in the printed machine-readable identifier; and

printing the cash letter and the machine-readable identifier based on the generated print stream.

9. A computer program product, comprising:

a computer-readable medium having computer-executable program code embodied therein for preventing duplicative electronic check processing, the computer-readable medium comprising:

computer-readable program code for receiving information obtained from a printed machine-readable identifier comprising information identifying a printed cash letter associated with the printed machine-readable identifier, the printed cash letter comprising at least one substitute check that is a legal equivalent of a corresponding paper check;

computer-readable program code for determining whether the cash letter was printed twice by determining whether information stored in a record comprises the received information, wherein the information stored in the record identifies cash letters that were printed previously; and

computer-readable program code for outputting an alert advising that the cash letter was printed twice in response to determining that the cash letter was printed twice.

10. A system for identifying duplicate printed cash letters, comprising:

means for reading information in a printed machine-readable identifier, the printed machine-readable identifier comprising information identifying a printed cash letter associated with the printed machine-readable identifier, the printed cash letter comprising at least one substitute check that is a legal equivalent of a corresponding paper check;

means for storing information in a record, wherein the information stored in the record identifies cash letters that were printed previously; and

means for determining whether the cash letter was printed twice by determining whether the information stored in the record comprises the read information,

wherein the means for storing stores the read information in the record in response to a determination that the cash letter was not printed twice.

11. The system of claim **10**, wherein the printed machine-readable identifier comprises a barcode.

12. The system of claim 10, wherein the information in the printed machine-readable identifier comprises information uniquely identifying the cash letter.

13. The system of claim 12, wherein the information uniquely identifying the cash letter comprises at least one of a total value of items in the cash letter, an ABA number of a bank that will receive a printed copy of the cash letter, a total number of item bundles in the cash letter, and a total number of items in the cash letter.

14. The system of claim 10, wherein the step of determining whether the cash letter was printed twice comprises the step of determining whether the record comprises information uniquely identifying the cash letter.

15. The system of claim 10, further comprising the step of outputting an alert advising that the cash letter was printed twice in response to determining that the cash letter was printed twice.

16. The system of claim 15, wherein the alert uniquely identifies the cash letter.

17. The system of claim 10, further comprising;

means for generating a print stream for the cash letter, the print stream comprising information to be included in the printed machine-readable identifier; and

means for printing the cash letter and the machine-readable identifier based on the generated print stream.

18. A system for identifying duplicate printed cash letters, comprising:

a check presentment module that generates a print stream for printing a cash letter, the print stream comprising information to be included in a printed machine-readable identifier comprising information identifying the cash letter, the printed cash letter comprising at least one substitute check that is a legal equivalent of a corresponding paper check;

a reading device that reads the information in the printed machine-readable identifier; and

a database that stores information in a record, wherein the information stored in the record identifies cash letters that were printed previously,

wherein the check presentment module determines whether the cash letter was printed twice by comparing the read information with the information stored in the record to determine whether the information stored in the record corresponds to the read information, stores the read information in the record in the database in response to determining that the cash letter was not printed twice, and outputs an alert advising that the cash letter was printed twice in response to determining that the cash letter was printed twice.

19. The system of claim 18, wherein the printed machine-readable identifier comprises a barcode.

20. The system of claim 18, wherein the information in the printed machine-readable identifier comprises information uniquely identifying the cash letter, the information uniquely identifying the cash letter comprising at least one of a total value of items in the cash letter, an ABA number of a bank that will receive a printed copy of the cash letter, a total number of item bundles in the cash letter, and a total number of items in the cash letter.

21. The system of claim 18, wherein the step of determining whether the cash letter was printed twice comprises the step of determining whether the record comprises information uniquely identifying the cash letter.

22. The system of claim 18, wherein the alert uniquely identifies the cash letter.

23. A computer program product, comprising:

a computer-readable medium having computer-executable program code embodied therein for preventing duplicative electronic check processing, the computer-readable medium comprising:

computer-readable program code for generating a print stream for a cash letter, the print stream comprising information to be included in a printed machine-readable identifier comprising information identifying the cash letter;

computer-readable program code for printing the cash letter and the machine-readable identifier, the printed cash letter comprising at least one substitute check that is a legal equivalent of a corresponding paper check;

computer-readable program code for receiving the information from the printed machine-readable identifier;

computer-readable program code for determining whether the cash letter was printed twice by determining whether information stored in a record corresponds to the received information;

computer-readable program code for storing the received information in the record in response to determining that the cash letter was not printed twice; and

computer-readable program code for outputting an alert advising that the cash letter was printed twice in response to determining that the cash letter was printed twice.

24. The method of claim 1, wherein the check presentment module performs the receiving step by reading the information from the printed machine-readable identifier.

25. The method of claim 1, further comprising the step of, prior to the receiving step, printing the cash letter and the associated machine-readable identifier.

26. The method of claim 1, wherein the check presentment module determines that the cash letter was printed twice in response to determining that the information stored in the record comprises the received information.

27. The system of claim 10, further comprising means for printing the cash letter and the associated machine-readable identifier.

28. The system of claim 18, further comprising a printer that receives the print stream and that prints the cash letter and the associated machine-readable identifier.

29. An apparatus for identifying duplicate printed cash letters, comprising a check presentment system that generates a print stream comprising information to be included in a printed machine-readable identifier identifying a cash letter and thereafter determines whether the cash letter was printed twice by comparing the printed machine-readable identifier with stored information identifying cash letters that were printed previously, the check presentment system outputting an alert advising that the cash letter was printed twice in response to determining that the stored information corresponds to the information in the printed machine-readable identifier, the printed cash letter comprising at least one substitute check that is a legal equivalent of a corresponding paper check.

30. The apparatus of claim 29, further comprising a database that maintains the stored information in a record.

31. The apparatus of claim 29, further comprising a reading device that reads the information in the printed machine-readable identifier.

32. The apparatus of claim 29, wherein the information in the printed machine-readable identifier comprises information uniquely identifying the cash letter, the information uniquely identifying the cash letter comprising at least one of a total value of items in the cash letter, an ABA number of a

bank that will receive a printed copy of the cash letter, a total number of item bundles in the cash letter, and a total number of items in the cash letter.

33. A computer-implemented method for identifying duplicate printed cash letters, comprising the steps of:

generating, via a check presentment module, an electronic print stream for a cash letter, the print stream comprising a plurality of substitute check records for the cash letter, at least one bundle summary control record for the cash letter, and at least one cover page control record for the cash letter, the electronic print stream further comprising information for a machine-readable identifier, the information identifying the cash letter, wherein printing of the print stream produces a printed version of the cash letter and a printed version of the machine-readable identifier;

communicating the print stream to a location that is remote from the check presentment module;

receiving by the check presentment module the information obtained from the printed version of the machine-readable identifier, thereby indicating that the electronic print stream has been printed to create the printed version of the cash letter;

determining by the check presentment module whether the paper version of the cash letter has been printed twice by determining whether information stored in a record corresponds to the received information, wherein the information stored in the record identifies cash letters that were printed previously; and

communicating, by the check presentment module, an alert to the remote location advising that the cash letter has been printed twice in response to determining that the cash letter was printed twice,

wherein the check presentment module is implemented in a computer system that comprises instructions stored in a machine-readable medium and a processor that executes the instructions.

34. The method of claim **33**, wherein the printed machine-readable identifier comprises a barcode.

35. The method of claim **33**, wherein the information identifying the cash letter comprises at least one of a total value of items in the cash letter, an ABA number of a bank that will receive a printed copy of the cash letter, a total number of item bundles in the cash letter, and a total number of items in the cash letter.

36. The method of claim **33**, wherein the step of determining whether the cash letter was printed twice comprises the step of determining whether the record comprises the information identifying the cash letter.

37. The method of claim **33**, further comprising the step of the check presentment module storing the received information in the record in response to determining that the cash letter has not been printed twice.

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